SWARTHMORE COLLEGE.

1889-90.

1889	1st Day	2d Day	3d Day	4th Day	5th Day	6th Day	7th Day
	.	1	2	3	4	5	6
	7	8	9	10	11	12	13
Seventh	14	15	16	17	18	19	20
Month.	21	22	23	24	25	26	27
	28	29	30	31	.	.	.
	.	.	.	.	1	2	3
	4	5	6	7	8	9	10
Eighth	11	12	13	14	15	16	17
Month.	18	19	20	21	22	23	24
	25	26	27	28	29	30	31
	.	.	.	.	.	.	.
	1	2	3	4	5	6	7
Ninth	8	9	10	11	12	13	14
Month.	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	.	.	.	.	.
	.	.	1	2	3	4	5
	6	7	8	9	10	11	12
Tenth	13	14	15	16	17	18	19
Month.	20	21	22	23	24	25	26
	27	28	29	30	31	.	.
	.	.	.	.	.	1	2
	3	4	5	6	7	8	9
Eleventh	10	11	12	13	14	15	16
Month.	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	.	.	.	.	.	.	.
	1	2	3	4	5	6	7
Twelfth	8	9	10	11	12	13	14
Month.	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31	.	.	.	.

1890	1st Day	2d Day	3d Day	4th Day	5th Day	6th Day	7th Day
	.	.	.	1	2	3	4
	5	6	7	8	9	10	11
First	12	13	14	15	16	17	18
Month.	19	20	21	22	23	24	25
	26	27	28	29	30	31	.
	.	.	.	.	.	.	1
	2	3	4	5	6	7	8
Second	9	10	11	12	13	14	15
Month.	16	17	18	19	20	21	22
	23	24	25	26	27	28	.
	.	.	.	.	.	.	1
	2	3	4	5	6	7	8
Third	9	10	11	12	13	14	15
Month.	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30	31	.	.	.	.	.
	.	.	1	2	3	4	5
	6	7	8	9	10	11	12
Fourth	13	14	15	16	17	18	19
Month.	20	21	22	23	24	25	26
	27	28	29	30	.	.	.
	.	.	.	.	1	2	3
	4	5	6	7	8	9	10
Fifth.	11	12	13	14	15	16	17
Month.	18	19	20	21	22	23	24
	25	26	27	28	29	30	31
	.	.	.	.	.	.	.
	1	2	3	4	5	6	7
Sixth.	8	9	10	11	12	13	14
Month.	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	.	.	.	.	.

1890	1st Day	2d Day	3d Day	4th Day	5th Day	6th Day	7th Day
	.	.	1	2	3	4	5
	6	7	8	9	10	11	12
Seventh	13	14	15	16	17	18	19
Month.	20	21	22	23	24	25	26
	27	28	29	30	31	.	.
	.	.	.	.	.	1	2
	3	4	5	6	7	8	9
Eighth	10	11	12	13	14	15	16
Month.	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	31	.	.	.	.	.	.
	.	1	2	3	4	5	6
Ninth	7	8	9	10	11	12	13
Month.	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	.	.	.	.
	.	.	.	1	2	3	4
	5	6	7	8	9	10	11
Tenth	12	13	14	15	16	17	18
Month.	19	20	21	22	23	24	25
	26	27	28	29	30	31	.
	.	.	.	.	.	.	1
	2	3	4	5	6	7	8
Eleventh	9	10	11	12	13	14	15
Month.	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30	.	.	.	.	.	.
	.	1	2	3	4	5	6
Twelfth	7	8	9	10	11	12	13
Month.	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	31	.	.	.

1891	1st Day	2d Day	3d Day	4th Day	5th Day	6th Day	7th Day
	.	.	.	.	1	2	3
	4	5	6	7	8	9	10
First	11	12	13	14	15	16	17
Month.	18	19	20	21	22	23	24
	25	26	27	28	29	30	31
	.	.	.	.	.	.	.
	1	2	3	4	5	6	7
Second	8	9	10	11	12	13	14
Month.	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	.	.	.	.	.	.	.
	1	2	3	4	5	6	7
Third	8	9	10	11	12	13	14
Month.	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31	.	.	.	.
	.	.	.	1	2	3	4
	5	6	7	8	9	10	11
Fourth	12	13	14	15	16	17	18
Month.	19	20	21	22	23	24	25
	26	27	28	29	30	.	.
	.	.	.	.	.	1	2
	3	4	5	6	7	8	9
Fifth	10	11	12	13	14	15	16
Month.	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	31	.	.	.	.	.	.
	.	1	2	3	4	5	6
Sixth	7	8	9	10	11	12	13
Month.	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	.	.	.	.

Photo by C.B. Doran

SWARTHMORE COLLEGE.

TWENTY-FIRST

ANNUAL CATALOGUE

OF

SWARTHMORE COLLEGE

SWARTHMORE, PA.

1889-90.

PRESS OF
FRIENDS' BOOK ASSOCIATION,
S. W. COR. 15TH AND RACE STREETS, PHILADELPHIA.

Contents.

CALENDAR.

1889–90.

1889.	Ninth Month, 10th, Third-day . .	Meeting of the Board of Managers.
"	Ninth Month, 10th, Third-day . .	Examinations for Admission began
"	Ninth Month, 11th, Fourth-day .	Examinations for Admission completed, and old students returned.
"	Ninth Month, 12th, Fifth-day . .	Regular Exercises began.
"	Twelfth Month, 2d, Second-day .	Meeting of the Board of Managers.
"	Twelfth Month, 3d, Third-day . .	*Annual Meeting of Stockholders.*
"	Twelfth Month, 3d, Third-day . .	Meeting of the Board of Managers.
"	Twelfth Month, 21st, Seventh-day	Winter Recess begins.
1890.	First Month, 2d, Fifth-day . . .	Students return.
"	First Month, 3d, Sixth-day . . .	Regular Exercises begin.
"	Second Month, 1st, Seventh-day .	First Semester ends.
"	Second Month, 3d, Second-day .	Second Semester begins.
"	Second Month, 10th, Second-day .	Commencement Appointments announced.
"	Third Month, 11th, Third-day . .	Meeting of the Board of Managers.
"	Third Month, 26th, Fourth-day .	Spring Recess begins.
"	Fourth Month, 2d, Fourth-day .	Students return.
"	Fifth Month, 1st, Fifth-day . .	Candidates for Degrees present Theses.
"	Fifth Month, 26th, Second-day .	Senior Examinations begin.
"	Sixth Month, 2d, Second-day . .	Senior Examinations completed and the results announced.
"	Sixth Month, 9th, Second-day . .	Final Examinations begin.
"	Sixth Month, 13th, Sixth-day . }	Examinations for Admission.
"	Sixth Month, 14th, Seventh-day }	
"	Sixth Month, 16th, Second-day .	Class Day Exercises.
"	Sixth Month, 16th, Second-day .	Meeting of the Board of Managers.
"	Sixth Month, 17th, Third-day . .	*Commencement.*
"	Ninth Month, 9th, Third-day . .	Meeting of the Board of Managers.
"	Ninth Month, 9th, Third-day . .	New Students arrive.
"	Ninth Month, 10th, Fourth-day .	Examinations for Admission.
"	Ninth Month, 11th, Fifth-day . .	Old Students return.
"	Ninth Month, 12th, Sixth-day . .	Regular Exercises begin.
"	Twelfth Month, 1st, Second-day .	Meeting of the Board of Managers.
"	Twelfth Month, 2d, Third-day . .	*Annual Meeting of the Stockholders.*
"	Twelfth Month, 2d, Third-day . .	Meeting of the Board of Managers.
"	Twelfth Month, 23d, Third-day .	Winter Recess begins.
1891.	First Month, 5th, Second-day . .	Students return and register.
"	First Month, 6th, Third-day . . .	Regular Exercises begin.

CORPORATION.

OFFICERS.

CLERKS.

GEORGE W. HANCOCK . . . . . *716 Chestnut Street, Philadelphia.*
FANNIE WILLETS LOWTHORP . . . . . *Trenton, N. J.*

TREASURER.

ROBERT BIDDLE . . . . . *507 Commerce Street, Philadelphia.*

BOARD OF MANAGERS.

Term expires Twelfth Month, 1890.

ISAAC H. CLOTHIER . . . . . *8th and Market Streets, Phila.*
JAMES V. WATSON . . . . . *718 Franklin Street, Philadelphia.*
HERMAN HOOPES . . . . . *516 Minor Street, Philadelphia.*
MARTHA G. McILVAIN . . . . . *59th St. and Elmwood Ave., Phila.*
SOPHIA U. WILLETS . . . . . *Manhasset, L. I.*
EDMUND WEBSTER . . . . . *1156 South Broad Street, Phila.*
EMMA McILVAIN . . . . . *59th St. and Elmwood Ave., Phila.*
REBECCA C. LONGSTRETH . . . . . *Sharon Hill, Delaware County, Pa.*

Term expires Twelfth Month, 1891.

JOSEPH WHARTON . . . . . *P. O. Box 1332, Philadelphia.*
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RACHEL W. HILLBORN . . . . . *Swarthmore, Pa.*

Term expires Twelfth Month, 1892.

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ELI M. LAMB . . . . . *1432 McCulloh St., Baltimore, Md.*
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HANNAH H. WOODNUTT . . . . . *1816 Arch Street, Philadelphia.*

Term expires Twelfth Month, 1893.

JOHN T. WILLETS . . . . . *303 Pearl Street, New York.*
CHARLES M. BIDDLE . . . . . *507 Commerce Street, Philadelphia.*
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SUSAN W. LIPPINCOTT,
M. FISHER LONGSTRETH,
LYDIA H. HALL,
ANNA M. HUNT,
HELEN COMLY WHITE,
RACHEL W. HILLBORN.

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JANE P DOWNING,
GEORGE W. HANCOCK,
EDMUND WEBSTER,
ISAAC H. CLOTHIER,
RACHEL W. HILLBORN.

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DANIEL UNDERHILL,
EDWARD H. OGDEN,
CLEMENT M. BIDDLE, *Treasurer*
M. FISHER LONGSTRETH, *Secretary.*

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SUSAN W. LIPPINCOTT,
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ELIZABETH B. PASSMORE
Ex-officio, M. FISHER LONGSTRETH.

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ISAAC H. CLOTHIER,
EDWARD H. OGDEN,
EMMOR ROBERTS.

FACULTY.*

1889–90.

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ELIZABETH POWELL BOND, Matron.

Prof. ARTHUR BEARDSLEY.

Prof. SUSAN J. CUNNINGHAM.

Prof. HENRY W. ROLFE.

Prof. WILLIAM PENN HOLCOMB.

Prof. BENJAMIN SMITH.

Prof. WILLIAM C. DAY.

Prof. GEORGE A. HOADLEY.

Prof. GERRIT E. H. WEAVER.

WILLIAM J. HALL, Superintendent.

* By-Laws.—"The President, Matron, and such of the resident Professors and others as may be elected by the Board, shall constitute the Faculty. They shall hold regular meetings, arrange the course of study, determine the qualifications for admission and for graduation, decide upon rules of order, and determine all questions pertaining to the discipline or instruction subject to the approval of the Executive Committee, to whom they shall report monthly."

OFFICERS OF INSTRUCTION.*

EDWARD H. MAGILL, LL.D.,†

President, and Professor of French.

JOSEPH LEIDY, M.D., LL.D.,

Emeritus Professor of Natural History, and Curator of the Museum.

ARTHUR BEARDSLEY, C.E., Ph.D.,

I. V. Williamson Professor of Engineering, and Director of the Workshops.

WILLIAM HYDE APPLETON, A.M., Ph.D.,

Professor of Greek and of English Literature, and Acting President.

SUSAN J. CUNNINGHAM, Sc.D.,

Edward H. Magill Professor of Mathematics and Astronomy.

HENRY W. ROLFE, A.M.,

Isaac H. Clothier Professor of the Latin Language and Literature.

WILLIAM PENN HOLCOMB, Ph.D.,

Joseph Wharton Professor of History and Political Science, and Lecturer on Pedagogics.

BENJAMIN SMITH, A.M.,

Professor of Rhetoric, Logic, Mental and Moral Philosophy.

WILLIAM CATHCART DAY, Ph.D.,

Professor of Chemistry.

SPENCER TROTTER, M.D.,

Professor of Natural History, and Lecturer on Physiology and Hygiene to the Young Men.

MILTON H. BANCROFT,

Professor of Art and of Mechanical Draughting.

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* Arranged, with the exception of the President, in the order of appointment, as: Professors, Assistant Professors, and other Instructors.

† Absent this year in Europe.

GEORGE A. HOADLEY, C.E.,
Professor of Physics.

GERRIT E. H. WEAVER, A.M.,
Professor of the German Language and Literature.

FERRIS W. PRICE, A.M.,*
Assistant Professor of Latin.

MYRTIE E. FURMAN, B.O.,
Assistant Professor in charge of Elocution.

FRANK CAWLEY, B.S.,
Assistant in Engineering.

MARY J. MURPHY,
Director of Physical Culture for the Young Women.

J. K. SHELL, M.D.,
Director of Physical Culture for the Young Men.

ELIZABETH L. PECK, M.D.,
Lecturer on Physiology and Hygiene to the Young Women.

SUSAN A. SHERMAN,
Instructor in French.

LUCIUS E. WILLIAMS, A.B.
Assistant in Chemistry.

FLORENCE L. YOST, Ph.B.,
Assistant in Latin and English.

MARIA DAVIS,
Assistant in Drawing.

MARY D. PRATT, A.B.,
Assistant in Mathematics.

ESTHER T. MOORE, A.B.,
Secretary to the President.

SARAH M. NOWELL,
Librarian.

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* Absent in Europe.

STUDENTS.

Graduate.

T. Montgomery Lightfoot, B. S., ... *Germantown, Pa.*

Undergraduates.

SENIOR CLASS.

Names.	*Courses.*	*Residences.*
Alvan W. Atkinson	Arts	*Buckingham, Pa.*
Sara H. Atkinson	Arts	*Holicong, Pa.*
George H. Bartram	Science . . .	*Milltown, Pa.*
Martha M. Biddle	Letters . . .	*Riverton, N. J.*
Emma J. Broomell	Science . . .	*Baltimore, Md.*
Edgar A. Brown (deceased)	Science . . .	*Mt. Pleasant, Ohio.*
Morris L. Clothier	Science . . .	*Wynnewood, Pa.*
Beulah W. Darlington . .	Arts	*Darling, Pa.*
Edward Darlington	Engineering .	*Darling, Pa.*
George Ellsler	Arts	*Baltimore, Md.*
Caroline R. Gaston	Arts	*Honey Brook, Pa.*
Abby M. Hall	Arts	*Swarthmore, Pa.*
Clara A. Hughes	Arts	*Lima, Ohio.*
Samuel R. Lippincott . . .	Science . . .	*Cinnaminson, N. J.*
William D. Lippincott . .	Engineering .	*Cinnaminson, N. J.*
Willard L. Maris	Science . . .	*West Chester, Pa.*
Robert S. McConnell . . .	Engineering .	*Philadelphia, Pa.*
Frances E. Ottley	Irregular . .	*Austin, Texas.*
Mary D. Palmer	Arts	*Ward, Pa.*
Mary E. Pancoast	Letters . . .	*Marple, Pa.*
James W. Ponder	Arts	*Milton, Del.*
Ellis B. Ridgway	Engineering .	*Coatesville, Pa.*
Walter Roberts	Arts	*Fellowship, N. J.*
Richard C. Sellers	Engineering .	*Swarthmore, Pa.*

Names.	*Courses.*	*Residences.*
Fannie B. Smith	Arts	*Swarthmore, Pa.*
Mary F. Soper	Science	*Jersey City, N. J.*
R. Barclay Spicer	Arts	*Baltimore, Md.*
William E. Sweet	Arts	*Colorado Springs, Col.*
Alice W. Titus	Letters	*Old Westbury, N. Y.*
Mary H. White	Arts	*Lansdowne, Pa.*

JUNIOR CLASS.

Names.	*Courses.*	*Residences.*
Emily Atkinson	Arts	*Moorestown, N. J.*
Samuel S. Bond	Irregular	*Sandy Spring, Md.*
Joseph Bringhurst	Irregular	*Wilmington, Del.*
Cosmelia J. Brown	Letters	*Lincoln, Va.*
Louis P. Clark	Engineering	*Philadelphia, Pa.*
Hannah H. Clothier	Irregular	*Wynnewood, Pa.*
Caroline M. Crisfield	Arts	*Princess Anne, Md.*
Eva M. Daniels	Irregular	*Charleston, W. Va.*
J. Lawrence Dudley	Irregular	*Washington, D. C.*
Eliza R. Hampton	Arts	*Spring Brook, N. Y.*
Isaac O. Harper	Irregular	*Baltimore, Md.*
Esther Haviland	Letters	*Brooklyn, N. Y.*
Eliza G. Holmes	Arts	*Moorestown, N. J.*
John W. Hutchinson, Jr.	Engineering	*New York, N. Y.*
Elizabeth C. Jessup	Arts	*Cinnaminson, N. J.*
Dora Lewis	Irregular	*Media, Pa.*
Lucy S. Lippincott	Arts	*Riverton, N. J.*
Chester P. Martindale	Letters	*Oxford, Pa.*
Harry L. McDonald	Engineering	*Kansas City, Mo.*
Pattie T. Miller	Irregular	*Sandy Spring, Md.*
Sarah T. Moore,	Letters	*Sandy Spring, Md.*
A. Mitchell Palmer	Arts	*Stroudsburg, Pa.*
Bertha C. Rolfe	Irregular	*Swarthmore, Pa.*
Marianna Smith	Irregular	*Lincoln, Va.*
William C. Sproul	Science	*Chester, Pa.*
Edward B. Temple	Engineering	*Ward, Pa.*
Katharine L. Tyler	Science	*Philadelphia, Pa.*
Zaida E. Udell	Irregular	*Grand Rapids, Mich.*

Names.	*Courses.*	*Residences.*
Frances M. White	Letters	*Lansdowne, Pa.*
Edward C. Wilson	Science	*Bloomfield, Ont., Can.*
M. Lilian Yarnall	Arts	*Ward, Pa.*

SOPHOMORE CLASS.

Names.	*Courses.*	*Residences.*
M. Ellen Atkinson	Irregular	*Buckingham, Pa.*
Benjamin F. Battin	Arts	*Omaha, Neb.*
Josephine Beistle	Arts	*Germantown, Pa.*
Mary E. Broomell	Letters	*Baltimore, Md.*
Mary P. Brown	Letters	*Lincoln, Va.*
Theodate P. Brown	Letters	*Lincoln, Va.*
Frederick C. Carr	Irregular	*Charleston, W. Va.*
Mary A. Cawley	Science	*Woodstown, N. J.*
Henry B. Coles	Engineering	*Moorestown, N. J.*
Roberta B. Dixon	Irregular	*Easton, Md.*
William L. Donohugh	Engineering	*Roxborough, Phila., Pa.*
Howard N. Eavenson	Engineering	*Philadelphia, Pa.*
Elisha Freeman	Engineering	*Orchard Park, N. Y.*
Henry H. Garrett	Engineering	*Philadelphia, Pa.*
Howard B. Green	Engineering	*Pedricktown, N. J.*
Charles Hart	Science	*Doylestown, Pa.*
Annie Hillborn	Irregular	*Swarthmore, Pa.*
Gertrude Hutchings	Irregular	*San Francisco, Cal.*
Caroline M. Jackson	Irregular	*Jericho, N. Y.*
Herbert C. Kendall	Engineering	*Reading, Pa.*
Charles B. Ketcham	Irregular	*Dover Plains, N. Y.*
Phebe H. Ketcham	Irregular	*Jericho, N. Y.*
Henry McAllister, Jr.	Letters	*Colorado Springs, Col.*
Carlie McClure	Arts	*Girard, Pa.*
Bernard S. McIlvain	Irregular	*Churchville, Md.*
John F. Murray	Engineering	*Wallingford, Pa.*
Georgia Porter	Irregular	*Worton, Md.*
Mary R. Price	Irregular	*Baltimore, Md.*
Ellen Pyle	Arts	*London Grove, Pa.*
Mary N. Quinter	Irregular	*Huntingdon, Pa.*
Laura M. Smith	Irregular	*San Francisco, Cal.*

Names.	*Courses.*	*Residences*
Mary E. Stebbins	Irregular	*Baltimore, Md.*
Caroline Taylor	Irregular	*Philomont, Va.*
Susan N. Van Trump	Letters	*Wilmington, Del.*
Joseph J. Walker	Engineering	*New Centreville, Pa.*
Mary B. Walker	Irregular	*Philadelphia, Pa.*
William E. Walter	Engineering	*Philadelphia, Pa.*
Florence N. Wolverton	Irregular	*Quakertown, N. J.*
Mary L. Wolverton	Arts	*Quakertown, N. J.*

FRESHMAN CLASS.

Names.	*Courses.*	*Residences.*
Martha C. Andrews	Arts	*Moorestown, N. J.*
Anna S. Atkinson	Irregular	*Buckingham, Pa.*
Jane Atkinson	Science	*Holicong, Pa.*
Moises Baltodano	Irregular	*Nicaragua, C. A.*
George H. Brooke	Science	*Sandy Spring, Md.*
Walter H. Brooke, Jr.	Engineering	*Sandy Spring, Md.*
Robert A. Burbank	Science	*Pittsfield, Mass.*
Frederick H. Cocks	Engineering	*Old Westbury, N. Y.*
Roland Conrow	Engineering	*Cinnaminson, N. J.*
Walter E. Davis	Irregular	*Scranton, Pa.*
Mahlon H. Dickinson	Irregular	*Philadelphia, Pa.*
Joseph T. Freeman	Engineering	*Orchard Park, N. Y.*
Emilie C. Garrett	Science	*Swarthmore, Pa.*
Dora A. Gilbert	Arts	*Chester, Pa.*
Elizabeth G. Guilford	Arts	*Philadelphia, Pa.*
Hanna W. Haines	Letters	*Media, Pa.*
Charles S. Hallowell	Engineering	*Denver, Col.*
Walter W. Hibbert	Engineering	*Wallingford, Pa.*
Helen S. Hutchinson	Irregular	*Mayberry, West Va.*
Edith H. Janney	Letters	*Occoquan, Va.*
S. Lucretia Keenan	Irregular	*Quaker City, Ohio.*
David R. Lippincott	Engineering	*Moorestown, N. J.*
Myra E. Lukens	Irregular	*Chatham Centre, Ohio.*
William B. Lukens	Engineering	*Philadelphia, Pa.*
Robert C. Manning	Engineering	*Trenton, N. J.*
William G. Marot	Engineering	*Lansdowne, Pa.*

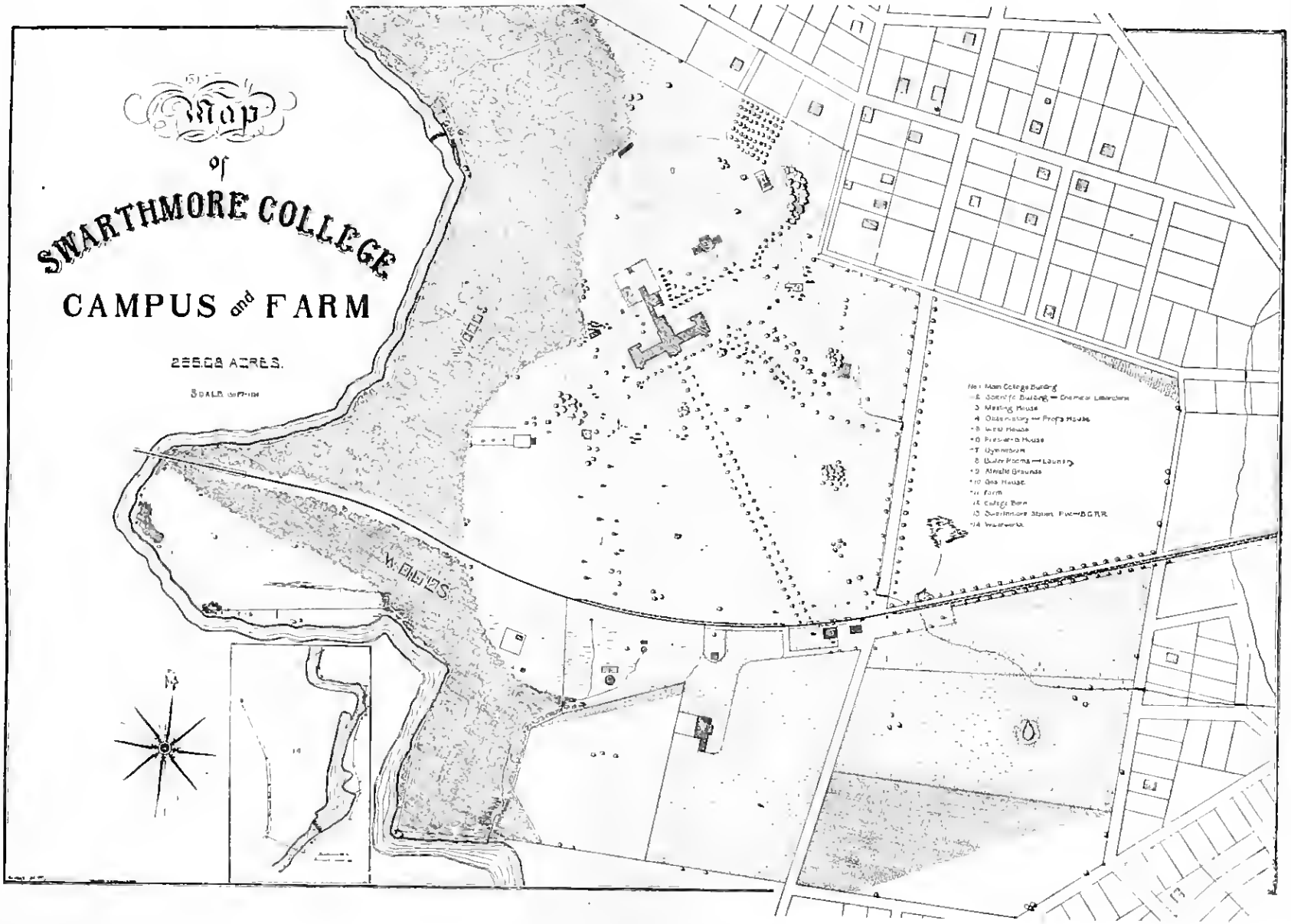
Names.	*Courses.*	*Residences.*
Lorena B. Matlack	Arts	*West Chester, Pa.*
M. Evelyn Meredith	Irregular	*Felton, Del.*
J. Spencer Miller	Engineering	*Oakdale, Pa.*
Margaret C. Moore	Arts	*Sandy Spring, Md.*
Rebecca T. Moore	Letters	*Sandy Spring, Md.*
Omar B. Pancoast	Science	*Woodstown, N. J.*
E. Pusey Passmore	Irregular	*Oxford, Pa.*
C. Alice Paul	Letters	*Philadelphia, Pa.*
Joseph M. Pugh	Engineering	*Port Deposit, Md.*
Jesse H. Reinhardt	Engineering	*Salem, N. J.*
Helen Riemensnyder	Irregular	*Lancaster, Pa.*
Gertrude A. Ryan	Irregular	*Washington, D. C.*
Cornelia J. Shoemaker	Irregular	*Lincoln, Va.*
Clarence W. Smith	Engineering	*Swarthmore, Pa.*
Frederick W. Speakman	Engineering	*Coatesville, Pa.*
Arthur Staab	Science	*Santa Fé, N. M.*
Julius Staab	Arts	*Santa Fé, N. M.*
John B. Stetson	Engineering	*Lansdale, Pa.*
Frances B. Stevenson	Letters	*Felton, Del.*
Clarence D. Stoner	Engineering	*Columbia, Pa.*
George H. Strout	Arts	*Portland, Me.*
Esther H. Sutton	Letters	*Chappaqua, N. Y.*
John A. Thayer	Science	*Charleston, West Va.*
Anna L. Thomas	Irregular	*Sandy Spring, Md.*
M. Helen Train	Irregular	*Zanesville, Ohio.*
Charles H. Walton	Engineering	*Trenton, N. J.*
Frances A. Walton	Irregular	*Philadelphia, Pa.*
Charles L. Warner	Engineering	*Titusville, Pa.*
George W. Warner	Engineering	*Titusville, Pa,*
Walter L. Watson	Irregular	*Scranton, Pa.*
Lila K. Willets	Arts	*Roslyn, N. Y.*
E. Newlin Williams	Science	*New Hope, Pa.*
S. Ellen Williams	Science	*Holicong, Pa.*
John M. Willis	Arts	*Fowling Green, Md.*
Keturah E. Yeo	Arts	*Easton, Md.*
Alice C. Youmans	Science	*Mt. Vernon, N. Y.*
Genevieve S. Zane	Arts	*West Chester, Pa.*

SUMMARY.

Seniors	30
Juniors	31
Sophomores	39
Freshmen	63
Total	163

SUMMARY BY STATES.

Pennsylvania	68
Maryland	22
New Jersey	21
New York	13
Virginia	7
Delaware	5
Ohio	5
West Virginia	4
Colorado	3
California	2
District of Columbia	2
New Mexico	2
Maine	1
Massachusetts	1
Michigan	1
Missouri	1
Nebraska	1
Texas	1
Canada	1
Nicaragua	1
Total	163


Map
of
SWARTHMORE COLLEGE
CAMPUS and FARM
255.08 ACRES.
WOODS
WOODS
N

GENERAL INFORMATION.

BUILDINGS AND GROUNDS.

Swarthmore College was founded by members of the religious Society of Friends, to provide the children of the Society and others with opportunities for higher education under guarded care. With this object in view, a property of two hundred and forty acres was secured ten miles from Philadelphia, on the Central Division of the Philadelphia, Wilmington, and Baltimore Railroad. It is accessible by trains from the Broad Street Station, nineteen times daily. About half the land is used for farming purposes, providing milk and vegetables for the College; the remainder is devoted to lawn and pleasure grounds. Crum Creek, which forms the western boundary of the property, affords facilities for boating, bathing, and skating. The portion of the grounds bordering the stream is of great picturesque beauty. The building site is high, thus securing perfect drainage and pure air, and commanding a fine view of the surrounding country for many miles.

The Principal College Building is a massive stone structure 348 feet long. It consists of a central building, four stories high, containing public rooms, such as lecture-rooms, museum, library, reading rooms, parlors, dining hall, etc. Fire-proof compartments separate this building from the two wings. The latter are each three stories high. The ground floors are devoted to lecture and recitation rooms, the remaining floors in the east wing contain the dormitories of the young women, and in the west wing, those of the young men. A number of the instructors reside in the same building with the students, and the relations between them are such that there is comparative freedom from the dangers and temptations ordinarily incident to college life. The buildings are heated throughout by steam, lighted by gas, and thoroughly ventilated.

The Science Hall is constructed of stone, in the most durable manner, and was planned with special reference to the work of students in Engineering, Physics, and Chemistry. It has a frontage of 130 feet, and a depth of 64 feet. The basement contains the wood-working shop, the blacksmith shop, and the foundry of the engineering department, and store-rooms. On the first floor are the machine shop and engineering lecture room, and the chemical and physical laboratories, and on the second floor are the draughting rooms and the chemical lecture room.

The Astronomical Observatory is especially arranged for purposes of instruction. The plan embraces a central building, supporting the dome, and two wings. There are four rooms: a transit-room, in which is placed an instrument of three inches aperture, also the mean-time clock, a pier-room, which is at present utilized as a sidereal clock room, a work-room, in which is placed a small library of reference books, the chronograph and chronometer; and the eome, containing the equatorial of six inches aperture. In connection with this latter instrument there is a micrometer and a spectroscope. The transit and equatorial were constructed by Warner & Swasey, of Cleveland, and the spectroscope by Brashear, of Allegheny. The equipment is ample for class work.

Connected with the observatory is the Signal Service Station of the State Weather Bureau, fully provided with the necessary meteorological and other apparatus.

Other Buildings are a meeting-house, the President's house, the West house (birthplace of Benjamin West, now used as a professor's residence), the house of the Professor of Astronomy, the Farmer's house and commodious farm buildings, the laundry and bakery, and the boiler house, containing the sectional boilers for heating and cooking purposes. All these buildings are constructed of stone.

LIBRARIES AND READING ROOM.

The Libraries of the College collectively contain 12,851 bound volumes, as follows:

The General Library	8,897
Literary Societies' Library	2,879
Friends' Historical Library	1,075

Members of the senior class are permitted, under proper regulations, to consult the Philadelphia Library, containing 145,000 volumes, and the Mercantile Library, containing 150,000 volumes. The general Library is at all times accessible to students. The Librarian will aid students in consulting the Library and in arranging courses of reading.

Friends' Historical Library, founded by the late Anson Lapham, of Skaneateles, N. Y., consists of Friends' books, photographs of representative Friends, and manuscripts relating to the Society and its history, and is, upon application to the Librarian, accessible to teachers, students, and members of the household.

This collection is stored in a fire-proof apartment, and it is hoped that Friends and others will deem it a secure place to deposit books and other material in their possession which may be of interest in connection with the history of the Society. Such contributions are solicited, and should be addressed to "Friends' Historical Library, Swarthmore, Pa."

The Reading Room, supplied with the leading literary and scientific journals, and the prominent newspapers of the principal cities, is open to students at all times except during the regular hours for study and recitations.

Literary Societies are maintained by the students. There are two for young men and one for young women. These hold regular meetings for the reading of essays, etc., and for practice in debate. Their Libraries, under their own management, contain over two thousand volumes, and are accessible to all students.

A Scientific Society and a Natural History Club are also maintained by the students interested in science.

THE MUSEUM.

The Museum of the College is strictly a teaching collection, and the specimens from its cases are in constant use in the lectures and laboratories in Natural History; it is growing steadily, but always in the direction of rendering more perfect the means of illustrating the different departments of natural history, and with no intention of making it a collection of curiosities or miscellaneous articles, however interesting they may be in their way.

It includes the following collections:

1. The **Joseph Leidy Collection of Minerals**, the result of thirty years' discriminative collecting by its founder, occupies four large double cases, and consists of exceedingly choice cabinet specimens of crystallized minerals, characteristic rocks and ores, and transparent and opaque models of the various systems of crystallization.

2. The **Collection of Comparative Osteology** consists of a large series of partial and complete skeletons, prepared at Prof. Henry Ward's Natural History Establishment, in Rochester, N. Y., and illustrating the structure of the framework of backboned animals.

3. The **Wilcox and Farnum Collection of Birds** comprises four large double cases of stuffed specimens of native and foreign birds. Nearly all the species visiting this State are represented.

4. The **Frederick Kohl Ethnological Collection** consists of two cases of Indian implements, weapons, clothing, etc., mostly from Alaska.

5. The **C. F. Parker Collection of Shells** is made up of six large cases of choice typical land, fresh-water and marine shells. These specimens were all selected by the Curator from the extensive collection of the late C. F. Parker, and render further additions to this branch needless. The founder of this collection was for many years the Curator in charge of the Academy of Natural Sciences of Philadelphia.

6. The **Robert R. Corson Collection of Stalactites, Stalagmites and Helictites**, represent the celebrated Luray Caverns, and illustrate the limestone formations which render these caverns the second in magnificence in the world.

7. The **Eckfeldt Herbarium** consists of over two thousand plants, illustrating the flora of Pennsylvania.

In addition to the above, there is a large and constantly-increasing collection of stuffed and alcoholic specimens of vertebrates and invertebrates (including the U. S. Fish Commission Educational Collection), of dissected specimens for demonstration in the lectures on Physiology and Hygiene, glass and papier-maché models of invertebrates and of special points in vegetable and animal morphology, besides some three hundred classified diagrams and finely-colored charts illustrating every branch of natural history.

During the past year much instructive material and a number of interesting specimens have been added to the museum, including a valuable series of bird-skins, the collection of the late William L. Collins,

presented through the liberality of members of the committee; skins of the Bay Lynx and the Mink, a fine series of Brook Trout, a number of North American snakes, several skeletons and other objects for study and demonstration.

Through the kindness of the Managers of the Pennsylvania Hospital, the carcass of an adult female gorilla captured in the Gaboon Country, West Africa, some years since, has been placed at the disposal of the professor of Natural History for dissection and demonstration.

THE GYMNASIUM.

The Gymnasium is supplied with a full set of apparatus for exercising according to the system of Dr. Sargent. The exercises are conducted in separate classes for the young men and young women, and are required of all.

Students are requested to bring from home a physician's certificate, if there be any cause that would make it dangerous for them to take part in the exercises required.

A large room in the main building also is set apart for the exercises of the young women.

The extensive and beautiful grounds connected with the College invite to out-door exercise, which is encouraged by the authorities. On the highest and driest part of the campus a space has been prepared for athletic games, with a quarter-mile cinder running track, a well graded field for foot-ball and base-ball, whilst the surrounding country offers facilities for cross country running.

GENERAL REGULATIONS.

Religious Exercises.—While care is taken to inculcate the doctrine that religion is a matter of practical daily life, and is not confined to the observance of set forms or the promulgation of religious tenets, the regular assembling for religious purposes is carefully observed. On First-day morning a religious meeting is held, attended by students, teachers, and members of the household, and occasionally by visiting Friends. The meeting is preceded by First-day school exercises, consisting of the recitation of passages of Scripture prepared by members of the different classes, and the reading of a portion of Scripture at the close. The daily exercises are opened by a general meeting

for reading selected portions of Scripture, or other suitable books, and for imparting such moral lessons as circumstances seem to require, followed by a period of silence before entering upon the duties of the day.

Leave of Absence will not be granted without a *written* request from parents or guardians, which request should give reasons that may be satisfactory to the Faculty.

Students may be visited, on week-days, by parents or guardians, or by near relatives, or others approved by parents or guardians; but general visiting is discouraged. *Students must not be interrupted in their studies or recitations at any time; nor must they be visited on First-day.*

All persons who are interested in education, and who are desirous of examining the methods of instruction and discipline at Swarthmore, will be welcomed at any time, and should, when convenient, communicate with the President upon the subject in advance.

The use of Tobacco *being strictly prohibited, those addicted to its use, unless prepared to renounce it entirely, should not apply for admission.*

Commencement and Vacations.—The College year begins on the second Third-day of Ninth month, and closes with Commencement-day, which occurs on the third Third-day of Sixth month.

Students are not admitted for a period less than the current College year, but when vacancies exist, may enter at any time during the year.

Besides the summer vacation, there will be a recess of about ten days at the close of the Twelfth month, and one week in the Fourth month. (See Calendar.)

Students are permitted to remain at the College, under care, during the recesses, but not during the summer vacation.

The Household.—In the organization of this institution unusual care has been extended to the personal comfort and the social interests of the students. This department is in charge of the Matron, with able assistants. She has also special oversight of the conduct and health of the young women and girls, and parents are desired to communicate freely with her in regard to the welfare of their daughters.

EXPENSES.

The cost of Board and Tuition is $450 per year, of which $250 is payable in advance, and $200 on the first of First month.

A deduction of $100 per year is made from the above charges to all students who are children of members of the religious Society of Friends.

For Day Students the price is $200 per year, of which $100 is payable in advance, and the remainder on the first of First month. A deduction of $50 per year is made from these charges to all students who are children of members of the religious Society of Friends. The day students dine with the resident students.

Books are furnished for the use of all students without expense, but they buy their own stationery, drawing implements, and certain tools and materials used in the workshops. Students taking laboratory courses make a deposit of $10 at the beginning of the course, to cover the expense of the material used. The unexpended balance is returned at the end of the course.

In case of illness, no extra charge is made unless a physician is employed.

The above figures may be depended upon as covering all necessary expenses, as **there are no extra charges.**

PAYMENTS.

Payments are to be made by check or draft to the order of

ROBERT BIDDLE, Treasurer,

No. 507 Commerce Street, Philadelphia.

INTRODUCTORY.

The studies required for a degree extend over four years. The requirements for admission are intended to be such as Friends' schools generally can meet. Owing to the enforcement of regular hours for study, and the absence of all opportunity for dissipation, the amount accomplished in four years is large, and is believed to afford a sufficient preparation in classics, science, and general culture for the ordinary avocations of life, for the study of any of the learned professions, or for the pursuit of special courses in the higher universities.

TIME AND CONDITIONS OF ADMISSION.

To secure places, application for admission should be made as early as possible by letter to the President.

All applicants must submit satisfactory testimonials of good character from their last teachers, and students coming from another college must present certificates of honorable dismissal.

The examinations for admission may be taken either in the Summer at the close of the College year, or in the Fall. The times are as follows for the year 1890.

SUMMER EXAMINATIONS.

Sixth-day,	Sixth	Month	13th,	at 8.15 A. M.	Mathematics.
"	"	"	"	" 10.30 A. M.	English.
"	"	"	"	" 11.30 A. M.	Geography.
"	"	"	"	" 2.00 P. M.	History.
"	"	"	"	" 3.00 P. M.	Latin.
"	"	"	"	" 4.00 P. M.	Greek.
Fifth-day,	"	"	12th,	at 8.15 A. M.	Physical Geography.
"	"	"	"	" 9.15 A. M.	German.
"	"	"	"	" 10.15 A. M.	French.
"	"	"	"	" 11.15 A. M.	Draughting (required of Science students.)

FALL EXAMINATIONS.

Candidates should present themselves at the college on the afternoon of Third-day, Ninth month 9th, 1890.

The examinations will occur as follows:

Fourth-day,	Ninth	Month	10th,	8.15 A.M.	Mathematics.
"	"	"	"	10.30 A.M.	English.
"	"	"	"	11.30 A.M.	Geography.
"	"	"	"	2 P.M.	History.
"	"	"	"	3 P.M.	Latin.
"	"	"	"	4 P.M.	Greek.
Fifth-day,	Ninth	Month	11th,	8.15 A.M.	Physical Geography.
"	"	"	"	9.15 A.M.	German.
"	"	"	"	10.15 A.M.	French.
"	"	"	"	11.15 A.M.	Draughting (required of Science students).

N. B.—Students are also admitted at any time during the year, and are charged for the unexpired time until the close of the year.

REQUIREMENTS FOR ADMISSION.

Candidates for the Freshman Class are admitted to college either on certificate or by examination. Blank certificates will be furnished each year to such principals of preparatory schools and such private teachers as may be named for the privilege. The faculty reserves the right, however, to withdraw from such school or teacher the privilege of sending pupils into college on certificates.

Candidates for admission to the Freshman Class will be examined in the following subjects:

1. MATHEMATICS.—*Arithmetic.*—Fundamental Rules, Fractions (common and decimal), Denominate Numbers, Percentage and its applications, Proportion, and the Metric System.

Algebra.—Through Equations of the second degree of one unknown quantity.

Geometry.—The whole of Plane Geometry.

2. ENGLISH.—The candidate will be asked to write a few pages upon some assigned subject, or from dictation. This exercise will be examined with reference to Grammar, Spelling, Paragraphing, Punctuation, and the use of Capitals. An examination will also be given in the principles of the grammar.

3. HISTORY.—A thorough preparation in the outlines of the history of the United States and of England. The amount required in each subject being equivalent to what is contained in the following text-books: Scudder's or Eggleston's School History of the United States, and Gardiner's School History of England, or Edith Thompson's History of England (Freeman's Historical Series).

4. GEOGRAPHY.—The general facts of Physical Geography, Descriptive and Political Geography, especially of the United States and Europe.

In addition to the above, the candidate will be examined in one of the following subjects as he may elect:

5. LATIN.—Cæsar, Gallic War, four books; Virgil's Æneid, six books; Allen's Latin Composition.

6. FRENCH.—The candidate should be familiar with the Grammar, especially with the formation and use of verbs. He should be able to read easy French at sight, and to translate simple English sentences into French.

7. GERMAN.—The preparation in German should occupy one year. The candidate should be able to read easy German at sight, and to translate simple English sentences into correct German.

Candidates for the *Classical Section* must pass the above examination in *Latin*. *Greek* is not required for admission, but students who have been prepared in Greek may continue in that language with students in the higher College classes.

Students applying for admission into the Freshman Class who may be found unable to meet all requirements, will be afforded an opportunity of completing their preparation by entering the recently established sub-collegiate class. This privilege will, however, be accorded to those only who shall be able to complete such preparation in a period not longer than one year. (See page 52.)

EXAMINATIONS FOR ADVANCED STANDING.—Candidates must pass satisfactorily in all the subjects pursued by the lower class or classes; but students coming with letters of honorable dismissal from other colleges, and showing that they have pursued courses of study equivalent to those taken by the classes they wish to enter, are admitted without examination.

Preparatory Schools authorized to send students to the College upon certificate,

Friends' Central School	Philadelphia, Pa.
Friends' Seminary	New York, N. Y.
Friends' High School	Baltimore, Md.
Woodstown Academy	Woodstown, N. J.
Friends' School	Wilmington, Del.
Friends' High School	West Chester, Pa.
Friends' High School	Moorestown, N. J.
Buckingham Friends' School	Lahaska, Pa.
Friends' Academy	Locust Valley, L. I.
Friends' Select School	Washington, D. C.
Sherwood School	Sandy Spring, Md.
Friends' School	Kennett Square, Pa.
Providence Preparative Meeting School	Media, Pa.

Pupils from these schools, intending to enter the College, should apply by letter for places as soon as convenient after the completion of their preparation. They should present themselves at the College on Fifth-day, Ninth month 11th, 1890.

Principals of other schools, who wish to have students admitted on their recommendation, should correspond with the President concerning each case.

II. A limited number of teachers and other persons of fair education and over twenty-one years of age, who may wish to improve themselves in particular studies, will be received without examination, and allowed to elect, in any of the regular classes, such work as they can pursue to advantage. They should in all cases correspond with the President in advance.

COURSES OF INSTRUCTION.

(Alphabetically Arranged.)

N. B.—For required and elective studies, and the number of exercises per week in each, see page 45.

CHEMISTRY.

The course of instruction in this subject extends over a period of four years; and aims to impart a thorough understanding of the most essential facts and principles of the science, while special attention is given to the cultivation of systematic habits of manipulation, so that, besides possessing value as part of a liberal education, it forms a foundation for such pursuits in life as require this knowledge.

Those who may desire to continue their work beyond the limits of the regular course will have suitable work assigned tnem, and will find every facility for carrying it on.

The Chemical Laboratory occupies rooms in Science Hall. It includes a room for work in general Chemistry and Qualitative Analysis, one for Quantitative Analysis, and a basement room for Assaying and Metallurgy. Near to these are store-rooms, a balance-room and a lecture-room. The laboratory tables are covered with glazed tiles; fume-closets, suction for filtration, water and gas are provided.

The lecture-room, with a seating capacity of one hundred, is furnished with water, gas, fume-closets, and abundant apparatus for lecture purposes. For lecture illustration there is an excellent collection of the metals and their salts, and a cabinet of minerals (deposited by Hugh Foulke); in addition to these, there is a complete set of typical preparations for use in the course in Organic Chemistry.

CHEMICAL LIBRARY.—In all cases students are encouraged in the habit of consulting for themselves the best authorities; and in a room near to the laboratory there will be found a number of standard works on chemistry; among them may be mentioned Watt's "Dictionary of Chemistry;" Roscoe and Schorlemmer's "Treatise on Chemistry," besides numerous other works on technical and analytical chemistry, and current chemical journals.

TEXT-BOOKS.—As the student advances in the course the following text-books are supplied: "Elementary Chemistry," Remsen; "Introduction to Qualitative Analysis," Beilstein; "Introduction to the Study of the Compounds of Carbon," Remsen; "Quantitative Chemical Analysis," Fresenius; "Theoretical Chemistry," Remsen.

1. *Freshman Class.*—LECTURES (EXPERIMENTAL).—*a.* General Elementary Chemistry (non-metals and metals), with examinations.

b. LABORATORY-WORK.—Special exercises on topics previously discussed in the lectures.

2. *Sophomore Class.*—LECTURES.—*a.* Theoretical Chemistry, followed by Qualitative Analysis.

b. LABORATORY-WORK.—Qualitative followed by Quantitative Chemical Analysis.

3. *Junior Class.*—LECTURES.—*a.* Chemistry of the compounds of carbon.

b. LABORATORY-WORK.—Quantitative Analysis, followed by a number of exercises in important, typical, organic transformations.

4. *Senior Class.*—The course during this year consists largely of laboratory work. A few special subjects are given to each student, with the understanding that he is to fulfil the practical and theoretical requirements of these subjects in a complete, exhaustive, and scholarly manner. Such work will involve the study of technical works, and a number of the current chemical journals. Meetings will occasionally be held for the consideration of important researches, as they appear from time to time in the journals.

DRAWING AND PAINTING.

A course of Freehand Drawing and Painting is open to all. Aside from its intrinsic value as a means of culture, it leads to habits of close observation, and is a very important adjunct to the other courses—especially to those of engineering and science.

It consists of drawing from objects and cast, and painting from still-life, flowers, etc., a series of lectures on Practical Perspective and upon the History of Painting. A Sketch Class is open to the students qualified to work in it. It is held one afternoon a week for out-door sketching in the Spring and Autumn, and during the Winter time sketches are made in the studio from cast and still life, in color, and light and shade.

The drawings required from each student before admission to the work of the advanced class are as follows:

FRESHMAN CLASS.

Pencil Outline	Cast—details of ornament. Plant or flower.
Light and Shade	Models—group. Objects. Cast—ornament.
Color	Landscape copy, or Flower copy.

SOPHOMORE CLASS.

Light and Shade	Cast—ornament. Objects—still life.
Color	Landscape—copy. Flower—copy. Objects.

JUNIOR CLASS.

Light and Shade	Cast—details of figure. Group—still life.
Color	Objects—still life.

SENIOR CLASS.

Light and Shade	Cast—head or figure. Head—sketch from life.
Color	Landscape—Nature. Flower or Fruit—Nature.

ENGINEERING AND MECHANIC ARTS.

This department is intended to give a good preparation to those students who are expecting to become either Civil or Mechanical Engineers, or to engage in any of the specialties of engineering practice.

The studies and exercises are so arranged that the graduates will be prepared to become immediately useful in the office, works, or field, in subordinate positions, and, after a fair amount of such practice, to design and take charge of important works.

The location of the College is most favorable for residence and study, combining the quiet of the country with ready access to Philadelphia and the many important manufacturing cities in its vicinity, and permitting frequent visits to industrial and engineering works of every kind.

The Department is well provided with the necessary field instruments, Transits, Levels, Plane-Table, etc., and each student is made familiar with their use and management by practical exercises in the field and draughting-room, carefully planned to illustrate the actual practice of the engineer. Included in the work of this department is a course in the Mechanic Arts, in which regular and systematic instruction is given in thoroughly equipped workshops, and by skilled instructors in the use of tools and machinery, and in methods and processes.

The Draughting Rooms are lighted from the north, are furnished with adjustable tables, models, etc., are well ventilated and warmed, and are open for work during the greater part of the day.

The Engineering Laboratory contains an Olsen's testing machine, arranged for tensile, compressive, and transverse tests, a steam engine indicator, apparatus for hydraulic experiments, and other valuable instruments and appliances. It includes several shops, in which the students become familiar with the nature and properties of the materials of construction (iron, wood, brass, etc.) employed by the engineer, and with the processes of working them into the desired forms for their intended uses.

The Machine Shop contains an excellent and complete assortment of tools, including 4 screw-cutting engine lathes, 3 speed-lathes (simple and back-geared), an iron planer, a complete universal milling machine, a set of milling cutters adapted for general purposes and or making other cutters, a shaper, a twist-drill grinder, 2 upright drills, an emery grinder, a mill grinder, a grindstone, 14 vises (plain and swivel), 14 lathe chucks (combination, independent, scroll, and drill), a milling machine chuck, a rotary planer chuck, planer centres, a set of Betts's standard gauges, surface plates (Brown & Sharpe), 3 sets of twist drills, reamers, mandrels, screw-plates, taps and dies, lathe centre grinder, a complete set of steam-fitters' tools with pipe vise, ratchet drill, etc., together with the many necessary small tools, hammers, chisels, files, etc. Additions are constantly being made to this collection, as they are needed, either by manufacture in the shops or by purchase. Power is furnished by a steam engine and boiler, the former fitted with an improved indicator, and the latter with the necessary attachments for determining its efficiency, etc.

The Wood-Working Shop contains 20 benches with vises, and 20 sets of wood-working tools, a grindstone, and wood-turning lathes.

The Smith-Shop contains 7 forges, 10 anvils, and sets of blacksmith tools, bench, and vise.

The Foundry contains a brass furnace, moulders' benches, a variety of patterns, and full sets of moulders' tools.

The details of the course vary somewhat from year to year; but, in general, are represented by the following arrangement of the studies:

1. Freshman Class.—*Machine Shop Practice:* vise work, chipping and filing to line, scraping, fitting, tapping, reaming, hand-turning in brass and iron.

Drawing: Special geometric problems, working drawings for the shop exercises, orthographic projections, shadows, brush work and tinting, machine drawing from copy and from measurements, gears, eccentrics, cams, pulleys, belting, etc.

Engineering: Lectures on the use of tools, on the properties of materials, etc.

2. Sophomore Class.—*Engineering:* Analytical mechanics of solids and fluids: descriptive geometry, including shades, shadows, and perspective; and the careful construction of the more important problems; land surveying, with field practice and map drawing.

Machine-Shop Practice.—Lathe work, turning, boring, screw-cutting, drilling, planing, milling, grinding, polishing, etc., construction of a project.

Drawing.—Working drawings for the shop exercises, sketches, drawings and blue prints for special work and projects, elements of machines, shadows and intersections, finished drawings.

3. Junior Class.—*Engineering:* Theory and practice of road surveying and engineering.

Geodesy.—Theory, adjustment and use of engineering field instrument; farm surveying; leveling; topographical, triangular, and hydrographical surveying.

Applied Mechanics.—Friction and other resistances; stress and strength of materials.

Drawing and Mechanism.—Topographical, structure, and machine drawing; principles of mechanism; visits to and sketches of special machinery and structures.

Practical Exercises in the field in the Fall and Spring months, and in general laboratory practice, including the testing of metals and building materials, the setting up, testing, and management of steam-engines, boilers, and machinery, throughout the year; with occasional visits to mechanical establishments, and to important engineering works in or near Philadelphia.

4. Senior Class.—*Engineering:* Theory and practice of road surveying and engineering, continued; building materials; stability of structures; foundations and superstructures; bridge construction.

Applied Mechanics—Practical hydraulics; practical pneumatics; general theory of machines; theory of prime movers, steam-engines, turbines, etc.; measurement of power.

Mechanism.—Principles of mechanism, of machine design, of the transmission of power; construction and use of tools.

Drawing.—Stone-cutting problems; topographical, structure and machine drawing; plans, profiles, and sections of road surveys; working drawings.

Practical Exercises.—As in Junior year, continued; tests of building materials; graduating thesis.

The degree conferred at the completion of the course is Bachelor of Science in Engineering.

ENGLISH LITERATURE.

The course in English Literature extends through four years, instruction being given by recitations and lectures. During this time the most prominent authors, from Chaucer to the present day, are made subjects of careful study. The particular feature of the course is the critical reading, in each year, of various masterpieces of literature, such as plays of Shakespeare, Milton's Paradise Lost, Pope's Poems, Tennyson's Idyls of the King, etc. Peculiarities of style and language are considered, allusions are looked up, and every effort made for a thorough comprehension of the work in hand. The author's life is studied in its relation to the history of the time, and his works are compared with those of his contemporaries. By this course it is expected that the student will be enabled, from his own observation, to form an intelligent estimate of the style and merits of the great authors of English Literature.

FRENCH.

PREPARATORY CLASS—Beginning French. Magill's Grammar and Reader; writing French Exercises.

1. FRESHMAN CLASS, *First Semester.*—Fenelon's Télémaque; Magill's Grammar; varied Selections from modern French writers.

2. SOPHOMORE CLASS, *Second Semester.*—Magill's Prose and Poetry; Magill's Grammar; varied selections in prose and poetry.

3. JUNIOR CLASS, *Second Semester.*—Bôcher's College Series of Plays; Dumas's Napoleon, etc.; Magill's Grammar.

4. SENIOR CLASS, *First Semester.*—Corneille's Cid; Racine's Athalie; Molière's Misanthrope; Les Précieuses Ridicules, etc.; Magill's Grammar.

GERMAN.

PREPARATORY CLASS.—Beginning German. The Grammar, with constant practice in writing exercises; reading German ballads and easy prose; conversational exercises; and memorizing easy selections.

1. FRESHMAN CLASS, *Second Semester.* Stories and easy plays—Eigensinn, Einer muss heirathen, etc.; selections from recent fiction, writing exercises, conversation, dictation, and memorizing easy selections.

2. Sophomore Class, *First Semester.*—Aus dem Leben eines Taugenichts; Wilhelm Tell, etc.; exercises in writing German; conversation, sight-reading and memorizing selections.

3. Junior Class, *First Semester.*—Schiller's Maria Stuart, Jungfrau von Orleans, etc.; dictation; writing; conversation; sight-reading and memorizing selections.

4. Senior Class, *Second Semester.*—Goethe or Lessing; Schiller's Prose; studies in the History of German Literature; conversation and writing; sight-reading and memorizing classic poetry and prose selections.

GREEK.

Greek is not required for admission to the College, but a course of three years is required for graduation with the degree of A. B., as per scheme below. Those who offer Greek on entering the College will go on in advanced classes. Those who have not previously studied the language will be required to complete the following courses:

Sophomore Class.—Goodwin's Grammar; Xenophon's Anabasis or Memorabilia (3 books).

Junior Class.—Plato's Apology of Socrates, Fernald's Greek Historians (selections), Greek Composition.

Senior Class.—Homer's Iliad or Odyssey (6 books), Sophocles (Antigone), Euripides (Hecuba), History of Greek Literature (Lectures).

HISTORY.

The instruction in history consists of lectures, recitations, oral and written reports by the students on various assigned topics that require the use of several standard authorities, map-drawing, and the preparation of diagrams to illustrate statistics. To encourage the study of history by means of biography, the preparation of biographical sketches of leading historical characters is required. All who intend to pursue the courses in history should be thoroughly familiar with the outlines of the history of the United States and England, before entering the Freshman Class.

The courses offered are as follows:

1. Freshman Class.—The course in history in the Freshman year is devoted to the history of Greece and Rome, introduced by a few

lectures reviewing the civilization of the ancient Oriental nations, and is designed as a basis for all future historical studies in later courses. Instruction is given four hours a week throughout the year, Oriental and Grecian history occupying the first semester, and Roman the last. A comparative study is made of the political, social, and religious institutions of Greece and Rome, and a biographical study of many of the prominent characters. Map drawing is made an important feature of the course, and is required of all classes in history.

2. Sophomore Class.—The character and institutions of Primitive Christianity; Teutonic Migrations; Church and State in the Middle Ages; the character and influence of the Renaissance; the eras of the Reformation and Thirty-Years War; Text-book,—Myers's Outlines of Mediæval and Modern History; reading in other authorities, such as Bryce, Milman, Hatch, Gibbon, Motley, Fisher, Symonds, Gardner, etc.

Before taking this course students must have taken the course in Roman history.

3. Junior Class.—*First Semester.*—English constitutional history and a study of the present form of government. Text-book; Montgomery's Leading Facts of English History. Authorities for topical study: Stubbs, Hallam, May, Bagehot, and the English Citizen Series.

Second Semester.—American political and constitutional history. The political and religious characteristics of the colonial governments are first studied, then the constitutional phases of the revolutionary period, the formation and adoption of the present constitution, the nature of the constitution, the political and constitutional history to the close of the reconstruction period, and a study of the present form of the national government. Authorities: Johnston, Frothingham, Bancroft, Curtis, Federalist, Von Holst, Schouler, American Statesmen Series, Original Documents, etc.

LATIN.

1. Freshman Class.—Cicero, orations; Sallust, Catiline.

2. Sophomore Class.—Horace.

3. Junior Class.—Cicero, De Senectute; Plautus; Terence.

4. Senior Class.—Lucretius, Livy, Juvenal, Tacitus, Latin Hymns.

LOGIC.

SENIOR CLASS.—*Logic.*—One exercise a week. (Jevons).

MATHEMATICS.

1. FRESHMAN CLASS. — Wentworth's College Algebra, through Quadratic Equations; Chauvenet's Geometry (Byerly's edition), Review and Book VI.; Wheeler's and Chauvenet's Plane Trigonometry.

2. SOPHOMORE CLASS.—Chauvenet's Geometry (Byerly's edition), finished; Wentworth's College Algebra, finished; Todhunter's Conic Sections; Young's General Astronomy.

3. JUNIOR CLASS.—Williamson's Differential and Integral Calculus; Chauvenet's Spherical Trigonometry; Determinants.

4. SENIOR CLASS. — Chauvenets Spherical and Practical Astronomy.

NATURAL HISTORY.

Under this head are included the studies of Zoology, Botany Physiology, Geology and Mineralogy.

The subjects are so arranged, throughout the four College years, that they form a graded course, admirably adapted to the purpose of training young men and young women in the right methods of thinking about and interpreting the problems continually presented to them by natural objects. While lectures and text-books are used to inspire the members of the class to study, these means are supplemented, in so far as possible, by drill in the laboratory and field; by which the students become accustomed to see for themselves, to gather facts, to study and arrange them, and to deduce the principles involved. The course is arranged as follows:

1. ZOOLOGY AND BOTANY.—(*a*) *Zoology.*—The course in Zoology consists of two lectures a week on the various groups of animals, their classification, anatomy, development, distribution, habits and economic relations; it extends over two years.

Vertebrates and invertebrates are considered in alternate years, thus carrying each class over the entire field. The lectures are illustrated by means of a large collection of colored charts and diagrams, and by specimens from the very complete set of skeletons, stuffed and preserved animals, shells and fossils.

(*b*) *Elementary Botany.*—Lectures, recitations, and practical laboratory work during a portion of the Freshman and Sophomore years.

The time is taken from the course in Zoology, the lectures of which are discontinued for the time. It is intended in this course only to teach the more prominent points in vegetal morphology, to accustom the student to accurate observation, and to the use of the analytical key for the determination of plants.

(*c*) *Advanced Botany.*—This course, during the Junior year, consists of practical laboratory work accompanied by explanatory lectures. It is intended in this course to furnish students with a working knowledge of the basis structure of the stems, leaves, roots, flowers, etc., of plants, in so far as material and time will allow, and to an extent sufficient to enable the student to appreciate their relations and to continue the subject by himself. A conservatory, convenient to the work-tables, will furnish material for study, which will be carried on by means of single and compound microscopes of the latest and most approved construction, and apparatus for the cutting of sections and preparation of specimens. Lectures on the geographical distribution of plants, the life histories of special cultivated plants, and on applied botany, will be delivered at intervals throughout the year. A set of reference works on structural and cryptogamic botany will be found in the laboratory, and is at the disposal of the students under the same conditions as the works on Biology.

For the purpose of instilling a love of plants and encouraging outdoor exercise, a garden has been established, in which students wishing it may have a plot of ground assigned to them. Here they may plant flowering plants and attend to them under the supervision of the Instructor in Botany.

2. Physiology and Hygiene.—A course upon these subjects is prescribed for the young men of the Freshman Class, and a separate but similar course for the young women in that class. The time is taken from the Freshman course in Zoology. *Attendance required of all students in the class.*

3. General Biology.—This course in life-science is intended to lead students to an intelligent understanding of the phenomena of their own existence and of the living things about them. Besides its value as an element of general culture, the engendering of habits of close observation, neat-handedness, and quick perception, it will be found of special value to such as contemplate taking up the study of medicine after completing their College course. The course extends through two

years, and consists of practical laboratory work accompanied by explanatory lectures.

The Biological Laboratory is well lighted by windows on the north. It is heated by steam and supplied with all the appliances, microscopical and otherwise, needed for the work carried on. A conservatory and numerous small aquaria furnish a constant supply of material for study, both in the course in Biology and in advanced Botany.

1. JUNIOR CLASS.—Manipulation of microscope; differences between living and lifeless bodies; differences between animals and plants; elementary structure of living bodies; elementary chemistry of animals and plants; physiological functions of animals and plants; the biology of some particular plants; the biology of some particular animals.

2. SENIOR CLASS.—Practical systematic work in the Museum, studies in comparative Osteology and the dissection of types of backboned animals as laid down in Martin and Moale's "Handbook of Vertebrate Dissection."

Students will find in the general library a large number of valuable and interesting works pertaining more or less directly to Biology.

In addition to these, there will be found in the Biological Laboratory books bearing directly on the subjects studied therein and necessary each day for the proper illustration and elucidation of the topic under consideration. These books are always at the disposal of the students, but must not be removed from the laboratory during working periods.

4. MINERALOGY AND GEOLOGY.—Once a week throughout the year. Informal discussions of geological problems, and how to treat them, accompany the practical study of hand specimens in the laboratory. This is followed by tramps through neighboring quarries, railroad cuts, etc., hammer in hand, under the personal supervision of the Instructor. The course is moreover illustrated by numerous charts and diagrams, and by specimens from the excellent collection of typical rocks, minerals, and fossils. Leconte's "Compend of Geology" is used, and supplemented by a very complete series of geological maps, works of reference, and lantern slides.

5. MINERALOGY.—Lectures and recitations once a week in crystallography and descriptive mineralogy, with two periods per week of practice in determining minerals by their physical properties, and by means of the blow-pipe; the whole counting as two periods. Students in Mineralogy will have access to the "Leidy Collection of Minerals."

PEDAGOGICS.

Instruction in this branch of education is mainly by lectures, with occasional practical illustrations in class work. During the course special educational topics are taken up, such as the origin, growth and needs of our public schools, school laws, the qualifications of a teacher, etc.

The attention of those designing to teach is constantly directed to the methods of work practiced by their various instructors, and they are required to inform themselves by the historical and theoretical study of education, with constant use of the best books of reference on the subject under the direction of a professor.

PHILOSOPHY.

Senior Class.—Mental Philosophy.—*First Semester.*—Porter's Elements of Intellectual Science is used as a Text-Book, and the subject is presented historically, with outlines of the different schools of Philosophy.

Moral Philosophy.—*Second Semester.*—A system of morals is taught, practical rather than theoretical, setting forth man's duties, and the application thereto of the moral law. The text-book used is Janet's Elements of Morals.

Lectures, Discussions, Essays, Examinations.

PHONOGRAPHY.

A course of lessons in Phonography; Corresponding and Reporting style. Graham's works are used as text-books.

PHYSICAL CULTURE.

The system of Physical Culture is based on a thorough examination of each student, carefully noting all defects of development, and functional weakness, and the ratio existing between the tested strength and the muscularity; and on these data formulating a course of exercises such as will meet the requirement of each individual, so as to produce an evenly developed and healthy organism.

The young men are required to give three hours each week for carrying out the prescription of the Director.

The sports of foot ball, base ball, and athletics are under the direct supervision of the Director, and only those who are physically fit are allowed to actively compete; great care is taken that the games be kept within proper limits, so as not to take too much of the students' attention or energy.

GYMNASIUM.

The physical culture of the young women is under the most careful supervision of a student of the Sargent System. Examinations are made and prescriptions given according to the special need of each student.

PHYSICS.

The Physical Laboratory is already provided with apparatus for determinations in the mechanics of solids and fluids, in heat, sound, light, electricity and magnetism; as also with a large amount for lecture experiments. Most of this has been selected with care from the best American and foreign makers, but some is of home manufacture, and the co-operation of the Engineering Department, and the increasing skill of our students, enable us now to make each year a larger proportion for regular use in the laboratory. It is our aim to afford students continued opportunities for instruction in the principles of construction of ordinary and special apparatus. Power for running dynamos and for other purposes is near at hand. The instruction begins in the Sophomore year, and extends through the course as follows:

For students in Arts and Letters:

Sophomore Class.—General Physics.—This course consists of the investigation of the general laws of Physics, and the consideration of their practical application.

The work of the course is done by lectures and recitations, accompanied by experimental verification of the laws discussed, and extends over the entire year.

Junior Class.—During the Junior year the course is an elective in Heat, Magnetism, Electricity and Light.

For Students in Science and Engineering.—This course occupies two consecutive years, requiring two periods per week in the Sophomore, and four in the Junior year. It is intended to be preeminently a practical course, consisting largely of laboratory work, in the investigation and verification of the laws of Physics.

The recitation work will cover the topics treated in Ganot's Physics, or some other text-book of equal rank, and will be supplemented by lectures on the various branches of the subject.

The division of the work is as follows.

Sophomore Class.—Applied Mechanics and Dynamics, and Sound.

Junior Class.—Heat, Magnetism, Electricity and Light.

Senior Class.—Applied Electricity.

This is an elective of eight periods per week, counting as four. In this the Junior work in Magnetism and Electricity is supplemented by the practical study of their application in the Telephone, Telegraph, Dynamo, Electric Light, Motor, Transmission of Power, etc.

Work in the manufacture and use of these various appliances as well as in the measurement of the electrical current is accompanied by text-book work in Ayrton's Practical Electricity, and by the reading and class discussion of current electrical journals. Visits to the electrical plants of the neighboring villages and cities are made at convenient times, for the purpose of studying the machinery in actual use.

POLITICAL SCIENCE.

Senior Class.—Political Economy.—*First Semester.*—The elements of political economy during the first part of the term, with Walker's Principles of Political Economy as a text-book. The course also includes a sketch of the history of political economy and the consideration of various social and industrial questions. Topics are assigned requiring reading in Mill, Thompson, Roscher, List, Marshall, Laveleye, etc.

Second Semester.—Elements of International Law, with especial attention to the important subjects of Peace and Arbitration.

READING AND SPEAKING.

This course extends over four years. It consists of training in respiration, articulation, enunciation, and the Delsarte system of ges-

ture as far as possible. Thought-conception is made the first step toward natural and effective expression. A careful study of the authors chosen is required, so that the course becomes to some extent one in English literature. The student studies critically, and becomes familiar with many selections of acknowledged excellence.

RHETORIC AND COMPOSITION.

FRESHMAN CLASS.—*Second Semester.*—Diction, Structure of Sentences and Paragraphs, Analysis of Subjects, Kinds of Prose Composition, Style, Figures of Speech, and Versification.

Themes once in four weeks in Narrative and Descriptive styles of composition.

SOPHOMORE CLASS.—Miscellaneous Themes; translations from Latin, Greek, English Prose and Poetry. Once in four weeks.

JUNIOR CLASS —Lectures on Oral and Written Discourse. Themes once in five weeks, embracing Criticisms, Argumentative Disputes, and Orations.

SENIOR CLASS.—Practice in Daily Themes; Reviews or Themes suggested by the life, characteristics, and writings of standard prose writers; Philosophical and Scientific Essays. Once in five weeks.

GENERAL REMARKS ON THE COURSES OF STUDY.

In arranging the courses of study, while recognizing the fact that the domain of human knowledge is so vast that he who would succeed best must confine his attention chiefly to some chosen field, we have endeavored not to lose sight of the equally important fact that those are best equipped for work in any particular department who have the most extended view of the realm of learning as a whole.

To secure in a measure both these results, minor courses in many of the subjects of the curriculum are required of all; while the more extended courses in each subject are taken only by those whose taste and inclination lie in that particular direction.

In pursuing this policy for several years, we have developed four distinct lines of study. In each of them are required those subjects which are essential to the logical and natural development of the course. The courses are as follows:

1. The Course in Arts, leading to the degree of Bachelor of Arts. The characteristic feature of this course is the study of Classical Antiquity, including the language and literature of the Greeks and Romans, with their art, philosophy, religion, and political and social history. Combined with this are courses in Modern Languages, Mathematics, and Science, with some elective subjects.

While this course affords that broad culture which should be the foundation of any subsequent career, it may be made to afford special preparation for Law or Journalism by including electives in History and Political Economy, or it may be shaped in the direction of Medicine by choosing electives in Biology and Chemistry.

2. The Course in Letters, leading to the degree of Bachelor of Letters. This course is arranged to provide a liberal education for those who do not wish to pursue the study of the ancient languages, nor to take all the science required in the Science Course. Its leading features

are a liberal amount of English, French, and German, and of History and Political Science. It includes the amount of Mathematics usually prescribed in a college course, with a fair amount of Science, and some elective subjects, including Latin.

3. The Course in Science, leading to the degree of Bachelor of Science. The characteristic feature of this course is more extended instruction in Science than in the preceding courses, together with a fair amount of Mathematics and Modern Language study, including English. The instruction in Physics, Chemistry, and Biology is of a twofold character; first, systematic treatment in experimental lectures; secondly, practical work in the laboratories. Thus the student acquires a familiarity, not only with the more important facts and fundamental principles of those sciences, but also with the correct methods of work, so that his course may form a foundation for subsequent higher work in any department of science.

4. The Course in Engineering, leading to the degree of Bachelor of Science in Engineering. This course offers, in its various studies and exercises, a training which is believed to be well adapted to the needs of Civil and of Mechanical Engineers, as well as of the large class who are to be concerned with the material interests of the country, with manufacturing, with industrial pursuits, or with any of the many other occupations allied to Engineering. It embraces liberal and technical instruction in the mathematical, physical, and graphical sciences, and their applications, in practical field engineering, in the arts of design and construction, and in the use of tools, materials and machinery, and in processes.

STUDIES OF THE
COURSE IN ARTS.

Elective studies must be so chosen as not to interfere with those which are prescribed. Extra studies are marked as other studies.

FRESHMAN YEAR.

First Semester.—*Prescribed.*—Latin, 4; French, 4; Mathematics, 4; History, 4; Elocution, 2; Natural History, 2. Total, 20 Periods.

Extras.—Phonography, 2; Drawing and Painting, 2; History, 2.

Second Semester.—*Prescribed.*—Latin, 4; German, 4; Mathematics, 4; Rhetoric, 2; History, 4; Natural History, 2. Total, 20 Periods.

Extra.—Phonography, 2; Drawing and Painting, 2; Elocution, 2.

SOPHOMORE YEAR.

First Semester.—*Prescribed.*—Greek, 4; Latin, 4; German, 4; Mathematics, 4; Physics, 2; Natural History, 2. Total, 20 Periods.

Extras.—Phonography, 2; Drawing and Painting, 2; Elocution, 2.

Second Semester.—*Prescribed.*—Greek, 4; Latin, 4; French, 4; Physics, 2 Natural History, 2; Electives, 4. Total, 20 Periods.

Electives.—History, 4; English, 4; Descriptive Astronomy, 2; Elocution, 2.

Extras.—Phonography, 2; Drawing and Painting, 2.

JUNIOR YEAR.

First Semester.—*Prescribed.*—Greek, 4; Latin, 4; Chemistry, 4; Electives, 8. Total, 20 Periods.

Electives.—German, 4; History, 4; English, 4; Physics, 4; Biology, 6=4; Pedagogics, 2.

Extras.—Phonography, 2; Drawing and Painting, 2; Elocution, 2.

Second Semester.—*Prescribed.*—Greek, 4; Latin, 4; History, 4; Electives, 8. Total, 20 Periods.

Electives.—French, 4; English, 4; Chemistry, 4; Physics, 4; Biology, 6=4; Pedagogics, 2.

Extras.—Phonography, 2; Drawing and Painting, 2; Elocution, 2.

SENIOR YEAR.

First Semester.—*Prescribed.*—Greek, 4; Mental and Moral Philosophy, 4; Political Science, 4; Logic, 2; Elocution, 2; Electives, 4. Total, 20 Periods.

Electives.—Latin, 4; Chemistry, 4; English, 4; French, 4; Biology, 6=4; Pedagogics, 2; Mineralogy, 2.

Extras.—Phonography, 2; Drawing and Painting, 2.

Second Semester.—*Prescribed.*—Greek, 4; Mental and Moral Philosophy, 4; Geology, 2; Elocution, 2; Electives, 8. Total, 20 Periods.

Electives.—Latin, 4; Chemistry, 4; English, 4; German, 4; Political Science, 4; Biology, 6=4; Pedagogics, 2; Mineralogy, 2.

Extras.—Phonograph, 2; Drawing and Painting, 2.

Physical Culture is required of all.

Essays are required throughout the course.

STUDIES OF THE
COURSE IN LETTERS.

Elective studies must be so chosen as not to interfere with those which are prescribed. Extra studies are marked as other studies.

FRESHMAN YEAR.

First Semester.—*Prescribed.*—French, 4; Mathematics, 4; English, 4; History, 4; Elocution, 2; Natural History, 2. Total, 20 Periods.

Extras.—Phonography, 2; Drawing and Painting, 2.

Second Semester.—*Prescribed.*—German, 4; Mathematics, 4; English, 4; Rhetoric, 2; Natural History, 2; History, 4. Total, 20 Periods.

Extras.—Phonography, 2; Drawing and Painting, 2; Elocution, 2.

SOPHOMORE YEAR.

First Semester.—*Prescribed.*—German, 4; Mathematics, 4; English, 4; Physics, 2; Natural History, 2; Electives, 4. Total, 20 Periods.

Electives.—Latin, 4; Elocution, 2; History, 2.

Extras.—Phonography, 2; Drawing and Painting, 2.

Second Semester.—*Prescribed.*—French, 4; History, 4; English, 4; Physics, 2; Natural History, 2; Electives, 4. Total, 20 Periods.

Electives.—Latin, 4; Descriptive Astronomy, 2; Elocution, 2.

Extras.—Phonography, 2; Drawing and Painting, 2.

JUNIOR YEAR.

First Semester.—*Prescribed.*—English, 4; History, 4; German, 4; Chemistry, 4; Electives, 4. Total, 20 Periods.

Electives.—Latin, 4; Physics, 4; Biology, 6=4; Pedagogics, 2; Elocution, 2.

Extras.—Phonography, 3; Drawing and Painting, 2.

Second Semester.—*Prescribed.*—English, 4; History, 4; French, 4; Electives, 8. Total, 20 Periods.

Electives.—Latin, 4; Chemistry, 4; Physics, 4; Biology, 6=4; Pedagogics, 2; Elocution, 2.

Extras.—Phonography, 2; Drawing and Painting, 2.

SENIOR YEAR.

First Semester.—*Prescribed.*—English, 4; Mental and Moral Philosophy, 4; Political Science, 4; Logic, 2: Elocution, 2; Electives, 4. Total, 20 Periods.

Electives.—Latin, 4; French, 4; Biology, 6=4; Mineralogy, 2; Pedagogics, 2.

Extras.—Phonography, 2; Drawing and Painting, 2.

Second Semester.—*Prescribed*—English, 4; Mental and Moral Philosophy, 4; German, 4; Geology, 3; Elocution, 2; Electives, 4. Total, 20 Periods.

Electives.—Latin, 4; Chemistry, 4; Political Science, 4; Biology, 6=4; Mineralogy, 2; Pedagogics, 2.

Extras.—Phonography, 2; Drawing and Painting, 2.

Physical Culture is required of all.

Essays are required throughout the course,

STUDIES OF THE
COURSE IN SCIENCE.

Elective studies must be so chosen as not to interfere with those which are prescribed. Extra studies are marked as other studies.

FRESHMAN YEAR.

First Semester.—*Prescribed.*—Chemistry, 4; Mathematics, 4; French, 4; History, 4; Natural History, 2; Elocution, 2. Total, 20 Periods.

Extras.—Phonography, 2; Drawing and Painting, 2.

Second Semester.—*Prescribed.*—History, 4; Chemistry, 6=4; Mathematics, 4; German, 4; Rhetoric, 2; Natural History, 2. Total, 20 Periods.

Extras.—Phonography, 2; Drawing and Painting, 2; Elocution, 2.

SOPHOMORE YEAR.

First Semester.—*Prescribed.*—Chemistry, 8=4; Mathematics, 4; German, 4; Physics, 2; Natural History, 2; Electives, 4. Total, 20 Periods.

Electives.—Latin, 4; English, 4; Elocution, 2; History, 2.

Extras.—Phonography, 2; Drawing and Painting, 2.

Second Semester.—*Prescribed.*—Chemistry, 8=4; Mathematics, 4; Mechanics, 4; Physics, 2; Natural History, 2; Electives, 4. Total, 20 periods.

Electives.—Latin, 4; English, 4; French, 4; History, 4; Elocution, 2; Descriptive Astronomy, 2.

Extras.—Phonography, 2; Drawing and Painting, 2.

JUNIOR YEAR.

First Semester.—*Prescribed.*—Physics, 4; Chemistry, 8=4; Biology, 6=4; German, 4; Electives, 4. Total, 20 periods.

Electives.—Mathematics, 4; History, 4; Pedagogics, 2; Elocution, 2; English, 4.

Extras.—Phonography, 2; Drawing and Painting, 2.

Second Semester.—*Prescribed.*—Physics, 4; Chemistry, 8=4; Biology, 6=4; French, 4; Electives, 4. Total, 20 periods.

Electives.—Mathematics, 4; History, 4; Latin, 4; English, 4; Pedagogics, 2; Elocution, 2.

Extras.—Phonography, 2; Drawing and Painting, 2.

SENIOR YEAR.

First Semester.—*Prescribed.*—Chemistry, 8=4; Mental and Moral Philosophy, 4; Political Science, 4; Logic, 2; Elocution, 2; Electives, 4. Total, 20 periods.

Electives.—Astronomy, 4; Physics, 4; Biology, 6=4; French, 4; English, 4; Mineralogy, 2; Pedagogics, 2.

Extras.—Phonography, 2; Drawing and Painting, 2.

Second Semester.—*Prescribed.*—Mental and Moral Philosophy, 4; Chemistry, 8=4; Geology, 2; Elocution, 2; Electives, 8. Total, 20 periods.

Electives.—Biology, 6=4; Political Science, 4; Astronomy, 4; Physics, 4; Latin, 4; German, 4; English, 4; Mineralogy, 2; Pedagogics, 2.

Extras.—Phonography, 2; Drawing and Painting, 2.

Physical Culture is required of all.

Essays are required throughout the course.

STUDIES OF THE COURSE IN ENGINEERING.

Elective studies must be so chosen as not to interfere with those which are prescribed. Extra studies are marked the same as other studies.

FRESHMAN YEAR.

First Semester.—*Prescribed.*—Engineering Practice, 3; Draughting, 3; Mathematics, 4; Chemistry, 4; Natural History, 2; Electives, 4. Total, 20 Periods.

Electives.—French, 4; History, 4; English, 4.

Extras.—Phonography, 2; Drawing and Painting, 2.

Second Semester.—*Prescribed.*—Engineering Practice, 3; Draughting, 3; Mathematics, 4; Chemistry, 6=4; Rhetoric, 2: Electives, 4. Total, 20 Periods.

Electives.—German, 4: English, 4,

Extras.—Phonography, 2; Drawing and Painting, 2.

SOPHOMORE YEAR.

First Semester.—*Prescribed.*—Descriptive Geometry and Surveying, 4; Engineering Practice, 2; Draughting, 2; Mathematics, 4; Chemistry, 6=2; Physics, 2; Electives, 4. Total, 20 Periods.

Electives.—German, 4; English, 4.

Extras.—Phonography, 2: Drawing and Painting, 2; Elocution, 2.

Second Semester.—*Prescribed.*—Mechanics, 4; Engineering Practice, 2; Draughting, 2; Mathematics, 4; Chemistry, 6=2; Physics, 2; Electives, 4. Total, 20 Periods.

Electives.—French, 4; History, 4; English, 4; Elocution, 2; Descriptive Astronomy, 2.

Extras.—Phonography, 2; Drawing and Painting, 2.

JUNIOR YEAR.

First Semester.—*Prescribed.*—Engineering, 6; Engineering Practice, 6=2; Mathematics, 4; Physics, 4; Electives, 4. Total, 20 Periods.

Electives.—Chemistry, 6=4; German, 4.

Extras.—Phonography, 2; Drawing and Painting, 2; Pedagogics, 2; Elocution, 2.

Second Semester.—*Prescribed.*—Engineering, 6; Engineering Practice, 2; Mathematics, 4; Physics, 4; Electives, 4. Total, 20 Periods.

Electives.—Chemistry, 6=4; French, 4.

Extras.—Phonography, 2; Drawing and Painting, 2; Pedagogics, 2; Elocution, 2.

SENIOR YEAR.

First Semester.—*Prescribed.*—Engineering, 8; Engineering Practice, 9=4; Elocution, 2; Logic, 2; Electives, 4. Total, 20 Periods.

Electives.—Astronomy, 4; English, 4; French, 4; Chemistry, 4; Physics, 4; Mineralogy, 2; Pedagogics,2.

Extras.—Phonography, 2; Drawing and Painting, 2.

Second Semester.—*Prescribed.*—Engineering, 8; Engineering Practice, 9=4; Elocution, 2; Geology, 2; Electives, 4. Total, 20 Periods.

Electives.—Astronomy, 4; English, 4; German, 4; Chemistry, 4; Physics, 4; Mineralogy, 2; Pedagogics, 2.

Extras.—Phonography, 2; Drawing and Painting, 2.

Physical Culture is required of all.

Essays are required throughout the course.

GRADUATION AND DEGREES.

It will be seen that all the above courses of study require four years for their completion.

As a condition of graduation, each student must submit to the Faculty a satisfactory Oration or Essay, which he must be prepared to deliver in public, if required to do so.

1. THE DEGREE OF BACHELOR.

The degrees of Bachelor of Arts, of Letters, and of Science are conferred on the completion of the corresponding courses.

2. THE DEGREE OF MASTER.

Candidates for the Master's degree are required to pursue a course of study at Swarthmore, or elsewhere, under the direction of the Faculty, and to pass examination in the same.

Persons residing at the College, and devoting their whole time to the work, can accomplish a sufficient amount in one year; for non-resident candidates, who are at the same time engaged in other work, the course must occupy not less than two years.

Application should be made directly to the Faculty, and should state the subject or subjects in which the applicants wish to present themselves. Work will then be assigned to them by the Faculty.

The examinations for the degrees will be both oral and written, and will be conducted by a committee of the Faculty, upon whose report the Faculty will decide upon the fitness of the candidate for the degree.

An extended thesis, bearing upon some part of the work assigned, will in all cases be required.

The degree of A.M. will be given to Bachelors of Arts who comply with the above conditions.

The degree of M.L. will be given to Bachelors of Letters who comply with the above conditions.

The degree of M.S. will be given to Bachelors of Science who comply with the above conditions.

3. THE DEGREE OF CIVIL ENGINEER.

The degree of C.E. will be conferred upon Bachelors of Science of the Engineering Department who shall have been engaged for not less than three years, in successful professional practice, in positions of responsibility, and who shall present an acceptable thesis upon a subject pertaining to Engineering.

Application for this degree must be made, and the thesis presented, at least *three months* before commencement.

DEGREES CONFERRED IN 1889.

At the Commencement in 1889 degrees were conferred upon the following graduates:

BACHELOR OF ARTS.

ALEXANDER G. CUMMINS, JR., ... *Smyrna, Del.*
J. CARROLL HAYES, ... *West Chester, Pa.*
MARY KIRK, ... *Lumber City, Pa.*
MARGARET J. LAURIE, ... *Jericho, N. Y.*
ALICE S. PALMER, ... *West Chester.*
LOUELLA PASSMORE, ... *Oxford, Pa.*
RALPH STONE, ... *Wilmington, Del.*

BACHELOR OF LETTERS.

CLARA HAYDOCK, ... *New York, N. Y.*
ELSIE D. STONER, ... *Columbia, Pa.*

BACHELOR OF SCIENCE.

JULIA HICKS, ... *Old Westbury, N. Y.*
FREDERICK B. PYLE, ... *London Grove, Pa.*
JENNIE F. WADDINGTON, ... *Salem, N. J.*

In Engineering.

JUSTIN K. ANDERSON, ... *Unionville, Pa.*
HOWARD A. DILL, ... *Richmond, Ind.*
HORACE B. FORMAN, ... *New York, N. Y.*
ELLIS M. HARVEY, ... *Ward, Pa.*
GEORGE A. MASTERS, ... *Philadelphia, Pa.*
WILLIS W. VAIL, ... *Quakertown, N. J.*

HONORARY DEGREES.

DOCTOR OF PHILOSOPHY.

ARTHUR BEARDSLEY.

DOCTOR OF LAWS.

ISAAC SHARPLESS.

THE SUB-COLLEGIATE CLASS.

In consequence of the action of the Board of Managers at a meeting held 12th month 2d, 1889, the Preparatory School was formally abolished, its existence terminating at the close of the present academic year, 1889-90. Instead of the Preparatory School, a class to be known as the Sub-Collegiate Class was established. This class is designed to afford students who are not at the time of application sufficiently advanced to enter the Freshman Class, an opportunity for making up their deficiencies, provided that this can be accomplished in a period not greater than one year.

REQUIREMENTS FOR ADMISSION.

Candidates for admission to the Sub-Collegiate Class will be examined in the following subjects.

1. **Mathematics.**—*Arithmetic.*—Fundamental Rules, Fractions (Common and Decimal), Denominate Numbers, Percentage and its applications, Proportion and the Metric System.

Algebra.—To Quadratic Equations.

Geometry.—Books I, II, III.

2. **English.**—Composition ; Grammar.

4. **History.**—A general outline of the History of the United States and of England, equivalent in amount to Scudder's History of the United States, and Gardner's School History of England.

4. **Geography.**—The general facts of Physical Geography, Descriptive and Political Geography, especially of the United States and Europe.

5. **Latin.**—(Required of Students in Arts). Cæsar, Gallic War, two books ; Virgil's Æneid, one book.

COURSE OF STUDY.*

First Semester.—Latin 4, or Draughting 8, counting as 4 ; Mathematics, 4 ; English, 4 ; French (throughout the year), 4, or German (throughout the year), 4 ; Writing and Spelling, 4. Total, 20 Periods.

Second Semester.—Latin 4, or Shopwork 4, counting as 2 ; Mathematics, 4 ; Free hand Drawing, 4 ; French (throughout the year), 4, or German (throughout the year), 4 ; Reading and Speaking, 4 ; English, 2. Total, 20 Periods.

* Latin is required of all Classical students, Draughting and Shop-work of all Scientific students, otherwise the course is the same for both classical and scientific students.

PUPILS IN PRESENT PREPARATORY CLASSES.

1889–90.

FIRST CLASS.

Names.	*Courses.*	*Residences.*
Charles Ballinger	Science	*St. Joseph, Mo.*
R. Alvan Beisel	Science	*Hazleton, Pa.*
Edwin P. Bond	Arts	*Swarthmore, Pa.*
Warren G. Boyer	Arts	*Boyertown, Pa.*
Frank D. Clark	Science	*Hazleton, Pa.*
J. Potter Clark	Science	*Hazleton, Pa.*
Anne R. Cooper	Irregular	*Philadelphia, Pa.*
Alonzo B. Davis	Science	*Philadelphia, Pa.*
James Dixon, Jr.	Science	*Easton, Md.*
Emma E. Donohugh	Arts	*Roxborough, Phila., Pa.*
Frank C. Eaton	Arts	*Ellenville, N. Y.*
Alfred W. Ellet	Science	*Kansas City, Mo.*
Marcus C. Fields	Science	*Ridley Park, Pa.*
Altus D. Flower	Arts	*Boston, Mass.*
Jewell Flower	Arts	*Boston, Mass.*
Le Clerc Gauntt	Science	*Lumberton, N. J.*
S. Louisa Haight	Arts	*Sparta, Canada.*
Charles G. Hallock	Science	*Peekskill, N. Y.*
Anna May Hart	Arts	*Sing Sing, N. Y.*
Henry L. Heulings	Science	*Moorestown, N. J.*
Helen R. Hillborn	Arts	*Swarthmore, Pa.*
Rachel L. Hutchinson	Irregular	*Mayberry, W. Va.*
Mary B. Janvier	Arts	*Wilmington, Del.*
Edward T. Kendall	Science	*Reading, Pa.*
Harriet M. Kent	Arts	*Swarthmore, Pa.*
Edward T. Lea	Irregular	*Wilmington, Del.*
Arthur Leggett	Science	*Williamsport, Pa.*
Robert W. Lippincott	Science	*Cinnaminson, N. J.*
Alexander S. Littleton	Science	*Hazleton, Pa.*
Lila C. Lungren	Arts	*Wilmington, Del.*

Names.	*Courses.*	*Residences.*
Evelyn R. Merrihew	Arts	*Germantown, Pa.*
Owen Moon, Jr.	Science	*Penn Valley, Pa.*
Edward Parrish	Science	*Brooklyn, N. Y.*
Margaret D. Pfahler	Arts	*Swarthmore, Pa.*
Rowland A. Richards	Science	*Toughkenamon, Pa.*
David B. Rushmore	Science	*Old Westbury, N. Y.*
Charles Saxman	Science	*Latrobe, Pa.*
Philip Sellers	Science	*Swarthmore, Pa.*
Millie Shattuck	Arts	*New York, N. Y.*
William W. Shattuck	Science	*New York, N. Y.*
Henry E. Simmons	Science	*Moore's, Pa.*
Edward A. Staab	Arts	*Sante Fé, N. M.*
Oliver E. Stanton	Arts	*Montreal, Canada.*
Mabel Washburn	Arts	*Easton, Pa.*
Estelle Waters	Arts	*Philadelphia, Pa.*
Stuart Wilder	Science	*Johnson City, Tenn.*

SECOND CLASS.

Names.	*Courses.*	*Residences.*
Mary W. Bacon	Arts	*Spring Lake Beach, N. J.*
Elizabeth M. Baily	Arts	*Norristown, Pa.*
Lloyd R. Blynn	Science	*Philadelphia, Pa.*
Clifford R. Buck	Science	*Mayberry, W. Va.*
Hamtonetta Burgess	Irregular	*Fallsington, Pa.*
John H. Burnley	Science	*Lenni, Pa.*
Raymond Burton	Arts	*Tullytown, Pa.*
Alfred C. Cass	Science	*Swarthmore, Pa.*
John L. Conard	Arts	*Trenton, N. J.*
George E. Cook	Science	*Philadelphia, Pa.*
Frank L. Cooper	Science	*Philadelphia, Pa.*
Francis J. Deemer	Science	*Chester, Pa.*
Thomas S. Donohugh	Science	*Roxborough, Phila., Pa.*
Donald C. Duffy	Science	*Marietta, Pa.*
Maria M. Foulke	Arts	*Stroudsburg, Pa.*
Edith E. French	Irregular	*Port Republic, N. J.*
Minnie L. French	Irregular	*Port Republic, N. J.*
Stewart A. Fritts	Science	*Crum Lynne, Pa.*

Names.	*Courses.*	*Residences.*
Harry B. Hughes	Arts	*Rutledge, Pa.*
Adolf Krakauer	Science	*El Paso, Texas.*
Joel N. Morris	Arts	*Washington, D. C.*
Harry C. S. Parrish	Science	*Brooklyn, N. Y.*
Alfred E. Pfahler	Science	*Swarthmore, Pa.*
Jane S. Shaw	Arts	*Williamsport, Pa.*
Alexander Shreve	Science	*Wrightstown, N. J.*
Gilbert T. Smith, Jr.	Science	*Sandy Spring, Md.*
Herbert S. Smith	Science	*Swarthmore, Pa.*
Peter A. Steffian	Science	*San Antonio, Texas.*
Mamie Talbot	Arts	*Philadelphia, Pa.*
Martha T. Valentine	Arts	*Glen Head, N. Y.*
Clara Vansant	Arts	*Constitution, Pa.*
Allen K. White	Science	*Lansdowne, Pa.*
Amy C. Willets	Arts	*Roslyn, N. Y.*
Richard D. Williams	Science	*Plainfield, N. J.*

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OF THE

ALUMNI ASSOCIATION.

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J. RUSSELL HAYES, '88 . . . . . *West Chester, Pa.*

SECRETARY.

ELIZABETH M. OGDEN, '82 . . . *West Chester, Pa.*

TREASURER.

JOSEPH T. BUNTING, '77 . . . . *Drexel Building, 5th and Chestnut Sts., Phila.*

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MARY J. ELLIOTT, '81 . . . . . *3204 Summer St., Phila.*

HETTY C. LIPPINCOTT, '88 . . . *Riverton, N. J.*

FLORENCE HALL, '80 . . . . . *Swarthmore, Pa.*

BUREAU OF PROFESSIONAL INFORMATION.

At the last annual meeting of the Alumni Association a "Bureau of Professional Information" was established to aid in obtaining employment for such graduates and ex-students of the college as might make application for positions. The Bureau is placed in charge of a committee, and to attain good results it will be necessary that all friends of the college co-operate with this committee and keep them informed of any vacancies they may have in their control, or that may come under their knowledge. The committee are:

MEDICINE.

DR. EDWARD MARTIN, Chairman *415 S. 15th St., Phila.*

DR. ISAAC G. SMEDLEY, ... *1705 Arch St., Phila.*

DR. MARY WILLETS, ... *1527 Green St., Phila.*

PEDAGOGICS.

ELIZABETH E. HART, ... *Doylestown, Pa.*

LAW.

JOSEPH FITCH, ... *237 Broadway, New York City.*

ENGINEERING.

HENRY B. SEAMAN, ... *135 St. James Place, Brooklyn, N. Y.*

FINANCE.

HERMAN HOOPES, ... *516 Minor St., Phila.*

DENTISTRY.

DR. FRANK L. BASSETT, ... *Girard Building, Broad and Chestnut Sts., Philadelphia.*

COMMERCIAL PURSUITS.

ALVIN T. SHOEMAKER, ... *11 Pine St., New York City.*

GRADUATES.

CLASS OF 1873.

Sarah H. (Acton) Hilliard, A.B. . . . . *Salem, N.J.*
Helen Magill, A.B. (Ph.D. Boston University, 1877) . . . *Brooklyn, N.Y.*
Elizabeth C. (Miller) Holcomb, A.B. . . . . *Swarthmore, Pa.*
Esther T. Moore, A.B. . . . . *Swarthmore College, Pa.*
* Maria C. (Pierce) Green, A.B. . . . . 1877.
Lowndes Taylor, A.B. . . . . *St. Paul, Minn.*

CLASS OF 1874.

Ellen H. (Evans) Price, A.M., 1884 . . . . . *Berlin, Germany.*
Amy W. (Hall) Hickman, A.B. . . . . *West Chester, Pa.*
* Alfred T. Haviland, B.S. . . . . 1874.
Mary (Hibbard) Thatcher, A.B. . . . . *Wilmington, Del.*
Herman Hoopes, C.E., 1879 . . . . . *Philadelphia, Pa.*
Ferris W. Price, A.M., 1887 . . . . . *Berlin, Germany.*
Elizabeth S. (Woolston) Collins, A.B. . . . . *Germantown, Pa.*

CLASS OF 1875.

John B. Booth, A.B. . . . . *Pittsburgh, Pa.*
Helen (Comly) White, A.B. . . . . *Lansdowne, Pa.*
Franklin H. Corlies, B.S. . . . . *Philadelphia, Pa.*
* Herbert G. Dow, A.B. (and Harvard, 1877) . . . . . 1878.
Lizzie (Hanes) Taylor, A.B. . . . . *Woodstown, N. J.*
Edith R. (Hooper) Roberts, A.B. . . . . *Titusville, Pa.*
Barton Hoopes, Jr., B.S. . . . . *Philadelphia, Pa.*
* Oliver Keese, Jr., B.S., ... 1879.
J. Reece Lewis, B.S. . . . . *Media, Pa.*
Howard W. Lippincott, A.B. . . . . *Philadelphia, Pa.*
Martha (McIlvain) Eastwick, A.B. . . . . *Philadelphia, Pa.*
John K. Richards, A.B. (and Harvard, 1877) . . . . . *Ironton, Ohio.*
William H. Ridgway, C.E., 1879 . . . . . *Coatesville, Pa.*

CLASS OF 1876.

Frank L. Bassett, B.S. (D.D.S. Phila. Dental College, 1878) . . . . . *Philadelphia, Pa.*
Arthur W. Bradley, A.B. . . . . *St. Paul, Minn.*

* Deceased.

Frances Linton, A.M., 1881 (M.D. Women's Medical College, Phila., 1886) . . . . . *West Chester, Pa.*
Elizabeth L. (Longstreth) Boyd, A.B. . . . . *Wynnewood, Pa.*
James T. McClure, B.S. . . . . *Philadelphia, Pa.*
Emma McIlvain, A.B. . . . . *Philadelphia, Pa.*
Edwin Mitchell, Jr., A.B. (B.L. and B.S.R., Sorbonne, Paris, 1877) . . . . . *New York, N. Y.*
Lucy R. (Price) McIntyre, A.B. (1880) . . . . . *Philadelphia, Pa.*
Isaac G. Smedley, B. S. (M.D. Hahnemann Medical College, 1879) . . . . . *Philadelphia, Pa.*
Herbert W. Smyth, A.B. (and Harvard 1878, Ph.D., Göttingen, 1884) . . . . . *Bryn Mawr College, Pa.*
Mary Willits, A.M., 1881 (M.D. Women's Medical College, Phila., 1881) . . . . . *Philadelphia, Pa.*
William P. Worth, B.S. . . . . *Coatesville, Pa.*

CLASS OF 1877.

Joseph T. Bunting, B.S. (LL.B. University of Penn., 1880) *Philadelphia, Pa.*
Norman B. Corson, A.B. . . . . *Norristown, Pa.*
Eudora Magill, A.B. . . . . *Paris, France.*
Jesse R. Norton, A.B. (and Harvard, 1879) . . . . . *Ironton, Ohio.*
Carroll R. Williams, A.M. 1882 (LL.B. University of Pa., 1880) . . . . . *Philadelphia, Pa.*
Florence M. Yeatman, A.B. . . . . *Norway, Pa.*

CLASS OF 1878.

Caroline E (Burr) Hall, A.B. . . . . *Swarthmore, Pa.*
Maybell P. Davis, A.B. . . . . *Newtonville, Mass.*
Howard Dawson, A.M., 1882 . . . . . *Boston, Mass.*
Tacy A. Gleim, A.B. . . . . *Fort Laramie, Wyoming.*
William J. Hall, B. S. . . . . *Swarthmore College, Pa.*
Mary P. (Hallowell) Hough, A.M., 1881 (Women's Medical College, Phila., 1881) . . . . . *Ambler, Pa.*
Charles A. Hawkins, A.B. . . . . *York, Pa.*
William Penn Holcomb, M.L. 1882 (Ph.D. Johns Hopkins Univ., 1886) . . . . . *Swarthmore College, Pa.*
Rebecca S. (Hunt) White, A.M., 1881 (M.D. Women's Medical College, Phila., 1881) . . . . . *Philadelphia, Pa.*
Anna E (Jackson) Monaghan, B.L. . . . . *West Chester, Pa.*
Llewellyn H. Johnson, B.S. . . . . *Orange, N. J.*
Edward Martin, A.M., 1882 (M.D. University of Penna., 1883) . . . . . *Philadelphia, Pa.*
Francis J. Palmer, B.S. . . . . *Brooklyn, N. Y.*
Israel Roberts, B.S. . . . . *Camden, N. J.*
William Seaman, C.E., 1884 . . . . . *Wilmington, Del.*
C. Harry Shoemaker, B.S. . . . . *Philadelphia, Pa.*

CLASS OF 1879.

Isaac R. Coles, C.E., 1880 . . . . . *Brooklyn, N. Y.*
William P. Pender, A.B. . . . . *Williamsport, Pa.*
William Lea Ferris, A.B. . . . . *Denver, Col.*
Joseph Fitch, A.B. . . . . *New York, N. Y.*
Ruth Anna Forsythe, A.B. . . . . *Wallingford, Pa.*
Elizabeth (Furnas) Bogardus, B.L. . . . . *New York, N. Y.*
P. Lesley Hopper, A.B. . . . . *Havre de Grace, Md.*
Marie A. Kemp, A.B. . . . . *Zürich, Switzerland.*
Elisha E. Lippincott, B.S. . . . . *Long Branch, N. J.*
Samuel Craig McComb, C.E., 1882 . . . . . *Downingtown, Pa.*
Charles R. Miller, B.L. (LL.B. University of Penna., 1881) *Wilmington, Del.*
Josephine (White) Breckens, A.B. . . . . *Cheyenne, Wyoming.*
Abigail M. (Woodnutt) Miller, B.L. . . . . *Wilmington, Del.*

CLASS OF 1880.

Anna E. Constable, A.B. . . . . *Philadelphia, Pa.*
Arthur Coleman Dawson, B.L., 1882 . . . . . *Chicago, Ill.*
Florence Hall, A.B. . . . . *Swarthmore, Pa.*
Myra T. Hillman, A.B. . . . . *Washington, D. C.*
Emily L. (Hough) Savidge, A.B. (and Univ. of Minn., 1881) *Kearney, Neb.*
Edward H. Keiser, M.S., 1881 (Ph.D. Johns Hopkins Univ.,
1884 . . . . . *Bryn Mawr College, Pa.*
Georgine (Kurtz) Muhlenberg, A.B. . . . . *Reading, Pa.*
Albert R. Lawton, A.M., 1885 . . . . . *New York, N. Y.*
Robert J. Marcher, B.S. . . . . *High Bridge, N. Y.*
Thomas L. Moore, A.B. . . . . *Richmond, Va.*
Ellen S. (Preston) Griest, A.B. . . . . *Cedarville, Va.*
John Turton, B.S. . . . . *New York, N. Y.*
Fannie Willets Lowthorp, A.B. . . . . *Trenton, N. J.*
Henry S. Wood, C.E., 1883 . . . . . *San Francisco, Cal.*

CLASS OF 1881.

Martha Bunting, B.L. . . . . *Philadelphia, Pa.*
William Canby, Jr., B.L. . . . . *St. Paul, Minn.*
Charles B. Doron, B.L. . . . . *Rochester, N. Y.*
Mary J. Elliott, B.L. . . . . *Philadelphia, Pa.*
Emma Kirk, B.L. . . . . *Bryn Mawr, Pa.*
Gertrude B. Magill, A.B. . . . . *Wilmington, Del.*
Eugene Paulin, Jr., A.B. (and Harvard, 1883) . . . . . *Bloomfield, N. M.*
Martha E. (Rhinoehl) Osborn, A.B. . . . . *Philadelphia, Pa.*
Edward C. Rushmore, B.S. (M.D. Columbia, 1885) . . . *Tuxedo Park, N. J.*
Henry B. Seaman, C.E., 1884 . . . . . *Brooklyn, N. Y.*
Charles E. Sharpless, C.E., 1884 . . . . . *Philipsburg, Pa.*
Alvin T. Shoemaker, B.L. . . . . *New York, N. Y.*

J. Byron Thomas, B.S. . . . . *Woodbury, N. J.*
Ernest F. Tucker, A.B. (M. D. Harvard, 1884) . . . . . *Bloomfield, N. M.*

CLASS OF 1882.

William Llewellyn Baner, A.B. (M.D. Columbia, 1885) . *New York, N. Y.*
Edith B. Blackwell, A.B. . . . . *El Mora, N. J.*
Charlotte E. Brewster, M.L., 1886 . . . . . *Philadelphia, Pa.*
William Butler, Jr., A.B. . . . . *West Chester, Pa.*
C. Herbert Cochran, A. B . . . . . *Philadelphia, Pa.*
Bertha (Cooper) Brewer, B.L. . . . . *Altoona, Pa.*
P. Fannie Foulke, A.B. . . . . *Philadelphia, Pa.*
Mary E. Gale, A.B. . . . . *Bryn Mawr College, Pa.*
*Sarah S. (Green) Pierce, A.B. . . . . 1883.
Margaret E. Hallowell, A.B. . . . . *Lansdowne, Pa.*
Elizabeth E. Hart, B.L. . . . . *Doylestown, Pa.*
Elizabeth Haslam, B.L. . . . . *Philadelphia, Pa.*
Elizabeth M. Ogden, B.L. . . . . *West Chester, Pa.*
Charles Palmer, A.M., 1885 . . . . . *Chester, Pa.*
*George C. Phillips, B.S. . . . . 1883.
Horace L. Rossiter, A.B. . . . . *Girard, Pa.*
Charles B. Turton. B.S. . . . . *New York, N. Y.*
Gerrit E. H. Weaver, A.B. (Harvard, 1884), A.M., 1886 . *Swarthmore College, Pa.*
Emily E. (Wilson) Lawton, A.M., 1885 . . . . . *New York, N. Y.*
Edgar M. Zavitz, A.B. . . . . *Coldstream, Ontario, Can.*

CLASS OF 1883.

Charles A. Bunting, B.S. . . . . *Steelton, Pa.*
*John L. Cochran, B.S. . . . . 1885.
Edgar Conrow, B.L. . . . . *Moorestown, N. J.*
Lydia S. (Green) Hawkins, A. B. . . . . *Media, Pa.*
Florence N. Hanes, A.B. . . . . *Woodstown, N. J.*
Alice W. Jackson, A.B. . . . . *Media, Pa.*
William A. Kissam, Jr., B.S. . . . . *Little Neck, N. Y.*
Bertha Matlock, B.L . . . . . *Camden, N. J.*
Guion Miller, A.M., 1888 . . . . . *Washington, D. C.*
S. Duffield Mitchell, A.B. . . . . *West Chester, Pa.*
Edward A. Pennock, A.B. . . . . *Chatham, Pa.*
George L. Pennock, B.S. . . . . *Lansdowne, Pa.*
Charles S. Pyle, B.S. . . . . *Rising Sun, Md.*
Helen C. (Pyle) Bunting, B.L. . . . . *Steelton, Pa.*
Frederick A. Seaman, Jr., B.S. . . . . *Madison, N. J.*
Annie E. (Tylor) Miller, M. L., 1888 . . . . . *Washington, D. C.*
James E. Verree, B.L. . . . . *Philadelphia, Pa.*
Emma (Webb) Price, A.B. . . . . *Philadelphia, Pa.*

*Deceased.

CLASS OF 1884.

Horace L. Dilworth, B.S. . . . . *Locust Valley, N.Y.*
Rebecca M. (Downing) Bullock, B.L. . . . . *Germantown, Pa.*
John D. Furnas, B.S. . . . . *Waynesville, Ohio.*
Sarah L. Hall, A.B. . . . . *Philadelphia, Pa.*
Henry J. Hancock, A.B. (LL.B. University of Penna.. 1886) *Philadelphia, Pa.*
Edwin Haviland, Jr., B.S , 1885 . . . . . *Salt Lake City, Utah.*
Mary E. Hughes, A.B. . . . . *Philadelphia, Pa.*
Laura H. Satterthwaite, A.B. (M.D. Women's Medical College, Phila., 1888) . . . . . *Trenton, N. J.*
Frederick J. Taylor, B.S. . . . . *Minneapolis, Minn.*
Mary Willits, A.B. . . . . *Wilmington, Del.*

CLASS OF 1885.

Minnie F. Baker, A.B. . . . . *Washington, D. C.*
Abigail Evans, A.B. . . . . *Washington, D. C.*
Frederick P. Moore, A.B. . . . . *New York, N.Y.*
Mary D. Pratt, A.B . . . . . *Swarthmore College, Pa.*

CLASS OF 1886.

Emma S. Bones, B.L. . . . . *New Brighton, N.Y.*
Arthur D. Cochran, B.S. . . . . *Westtown, Pa.*
George J. Freedley, B.S. . . . . *Richmond, Va.*
Helen G. Johnson, A.B. . . . . *Muncy, Pa.*
Ella Merrick, A.B. . . . . *Moorestown, N. J.*
Edgar M. Smedley, B.S. . . . . *Media, Pa.*
Rowland J. Spencer, B.L. . . . . *Portland, Oregon.*
Martha M. Watson, A.B. . . . . *Trenton, N. J.*
C. Percy Willcox, B.S. (B.S. Yale College, 1887) . . . . *Philadelphia, Pa.*

CLASS OF 1887.

Alice T. (Battin) Lewis, A.B. . . . . *Swarthmore, Pa.*
Harriett J. Cox, B.S. . . . . *Malvern, Pa.*
Horace Darlington, B.S. . . . . *Darling, Pa.*
Harry B. Goodwin, B.S. . . . . *Bordentown, N. J.*
Anna M. Jenkins, A.B. . . . . *Gwynedd, Pa.*
Thomas A. Jenkins. A.B. . . . . *Gwynedd, Pa.*
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Linda B. Palmer, A.B. . . . . *West Chester, Pa.*
Horace Roberts, A.B. . . . . *Fellowship, N. J.*
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CLASS OF 1888.

Alice M. Atkinson, A.B. (A.B. Cornell University, 1889) . *Lahaska, Pa.*
Thomas Brown, B.S. . . . . *Washington, D. C.*
Frank Cawley, B.S. . . . . *Swarthmore College, Pa.*
Jessie L. Colson, B.S. . . . . *Daretown, N. J.*
Sadie M. Conrow, A.B. . . . . *Cinnaminson, N. J.*
William L. Dudley, B.S. . . . . *Washington, D. C.*
Robert P. Ervien, B.S. . . . . *Shoemakertown, Pa.*
E. Lawrence Fell, B.S. . . . . *Philadelphia, Pa.*
Joyeuse L. Fullerton, A.B. (A.B. Cornell University, 1889) *Philadelphia, Pa.*
Emma Gawthrop, B.S. . . . . *Wilmington, Del.*
Alice Hall, A.B. . . . . *Swarthmore, Pa.*
P. Sharples Hall, B.S. . . . . *Hahnemann Medical College, Phila., Pa.*
Walter Hancock, B.S. . . . . *Philadelphia, Pa.*
J. Russell Hayes, A.B. . . . . *West Chester, Pa.*
Martha P. Jones, A.B. . . . . *Conshohocken, Pa.*
T. Montgomery Lightfoot, B.S. . . . . *University of Penna., Pa.*
Hetty C. Lippincott, A.B. . . . . *Riverton, N. J.*
Ellis P. Marshall, Jr., B.S. . . . . *London Grove, Pa.*
William S. Marshall, B.S. . . . . *Berlin, Germany.*
Aaron C. Pancoast, B.S. . . . . *San Antinio, Texas.*
Jessie Pyle, A.B. (A.B. Cornell University, 1889) . . . . *London Grove, Pa.*
Joseph J. Rhoads, B.S. . . . . *Bellefonte, Pa.*
Katherine M. Rider, B.L. . . . . *Brooklyn, N. Y.*
William H. Seaman, B.S. . . . . *Jericho, N. Y.*
Amelia Skillin, A.B. . . . . *Moorestown, N. J.*
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Charlotte M. Way, B.S. . . . . *Tempe, Arizona.*
Annie E. Willits, A.B. . . . . *Syllsset, N. Y.*
Esther M. Willits, B.L. . . . . *Plymouth, Pa.*
Frank P. Wilson, A.B. . . . . *Locust Valley, N. Y.*

CLASS of 1889.

Justin K. Anderson . . . . . *Bickley's Mills, Va.*
Alexander G. Cummins, Jr. . . . . *New York, N. Y.*
Howard A. Dill . . . . . *Boston, Mass.*
Horace B. Forman, Jr. . . . . *Branwell, W. Va.*
Ellis M. Harvey . . . . . *University of Penna., Pa.*
Clara Haydock . . . . . *New York, N. Y.*
J. Carroll Hayes . . . . . *Harvard University, Cambridge Mass.*
Julia Hicks . . . . . *Cornell University.*
Mary Kirk . . . . . *New York, N. Y.*

Margaret J. Laurie	*Jericho, N. Y.*
George A. Masters	*Philadelphia, Pa.*
Alice S. Palmer	*West Chester, Pa.*
Louella Passmore	*Oxford, Pa.*
Frederic B. Pyle	*London Grove, Pa.*
Ralph Stone	*Wilmington, Del.*
Elsie D. Stoner	*Columbia, Pa.*
James V. Upson	*San Antonio, Texas.*
Willis W. Vail	*Quakertown, N. J.*
Jennie F. Waddington	*Salem, N. J.*

HONORARY DEGREES CONFERRED.

1888.

William Hyde Appleton, A.B., Harvard, 1864, and A.M., LL.B. Harvard 1869, Ph.D., Professor of Greek and of English Literature.

Susan J. Cunningham, Sc.D., Professor of Mathematics and Astronomy.

1889.

Arthur Beardsley, C.E., Rensselaer Polytechnic Institute 1867, Ph.D., Professor of Engineering and Director of Mechanic Arts.

Isaac Sharpless, B.S., Harvard, 1873, Sc.D., University of Pennsylvania, 1883, LL.D., President of Haverford College.

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